Today's choice: Avoid yards — or improve them

September 24, 1979

RAILWAY AGE

Railroads plug in to solar power

By Christmas, we will have the capacity to supply bearings for all the freight cars scheduled for delivery in 1980.

And maybe a little more.

We have been growing by leaps and bounds in the past couple of years. It's paying off in increased capacity to meet the unusual demand that the railroads are making on bearing manufacturers.

Our goal: the ability to supply 80,000 carsets of bearings during the year 1980... if that is what it takes to meet the railroad's needs. Perhaps you won't ask that of us, but we are gearing up to handle it, in case you do.

Right now we are supplying bearings at a rate that's close to 1978's freight car deliveries. It's a bit of a strain. That's why we are looking forward to the completion of our current expansion program.

We are really committed to this goal. For example, our cup and ring forging capacity has recently grown to meet the 80,000 mark. Down the line, the rest of our production facilities are being expanded to meet this. By Christmas, we should be there.

There's another goal for our expansion. That is to keep tapered roller bearings prices in line. We've been doing this successfully for a long time. Maintaining an advanced, efficient manufacturing plant has enabled us to keep costs down and yet deliver rugged, reliable bearings. We believe that's what you want.

In the meantime, Merry Christmas!

BRENCO

Brenco: dedication to the future.

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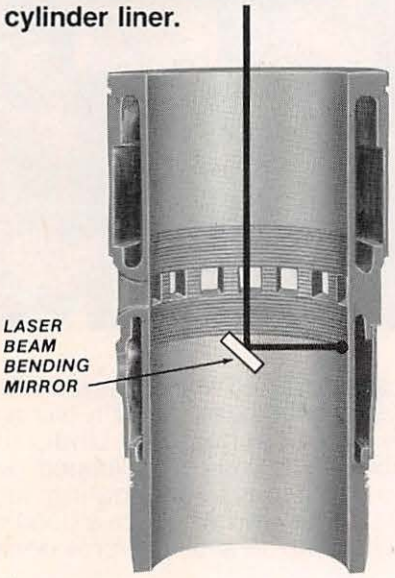
GM experience: The technology that improves our new engines lets you upgrade your older ones.

We're constantly making improvements in the EMD Diesel engine. Improvements which you'll also find in EMD replacement parts.

There is only one place where you can order EMD replacement parts—from your EMD Parts Center. And only EMD replacement parts give you the latest engine technology—enabling your EMD Diesel to run at peak efficiency with lowest fuel consumption. It's the only way you can insure your EMD Diesel is as up to date as possible.

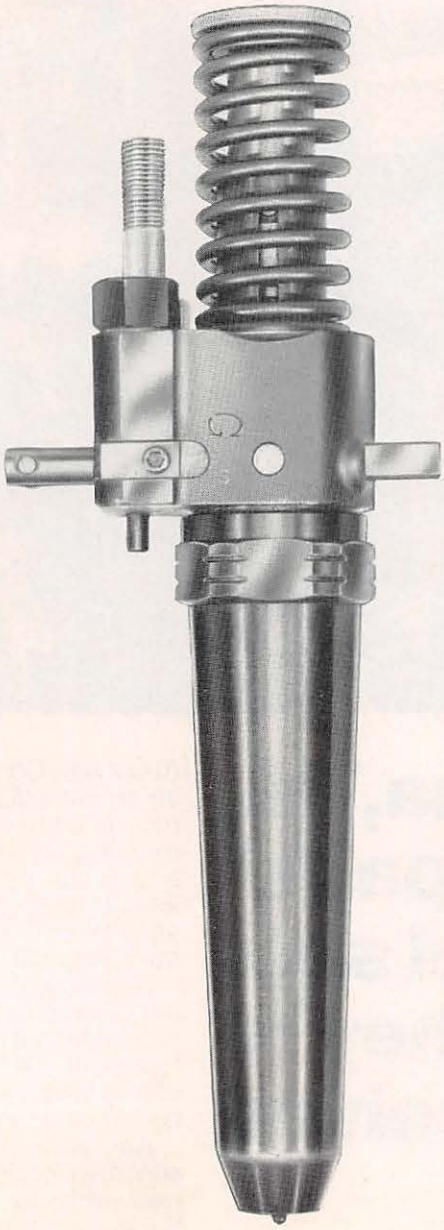
Here are three examples:

The EMD laser-hardened cylinder liner.



It's the only laser-hardened cylinder liner you can buy. We use the world's largest industrial lasers to harden the port relief area of these liners. This reduces friction, minimizes ring breakage, and helps your engine work longer with less maintenance.

EMD's fuel injector tip.
Designed specifically for your EMD engine. It makes our Diesels burn fuel more efficiently and greatly reduces emission levels.



The seal ring traction motor support bearings.
A patented seal ring decreases oil loss 50%, and doubles the length of the maintenance cycle.

You can update your older EMD power because many EMD replacement parts are retrofitable to older units.

The EMD Parts Center in LaGrange, Illinois, inventories over 31,000 different replacement parts. Nine other Parts Centers located strategically around the country deliver parts built with EMD technology and experience.

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General Motors Corporation, Electro-Motive Division, LaGrange, Illinois 60525. For EMD technology and service you can trust.

ELECTRO-MOTIVE

EMD GM

Division of General Motors Corporation

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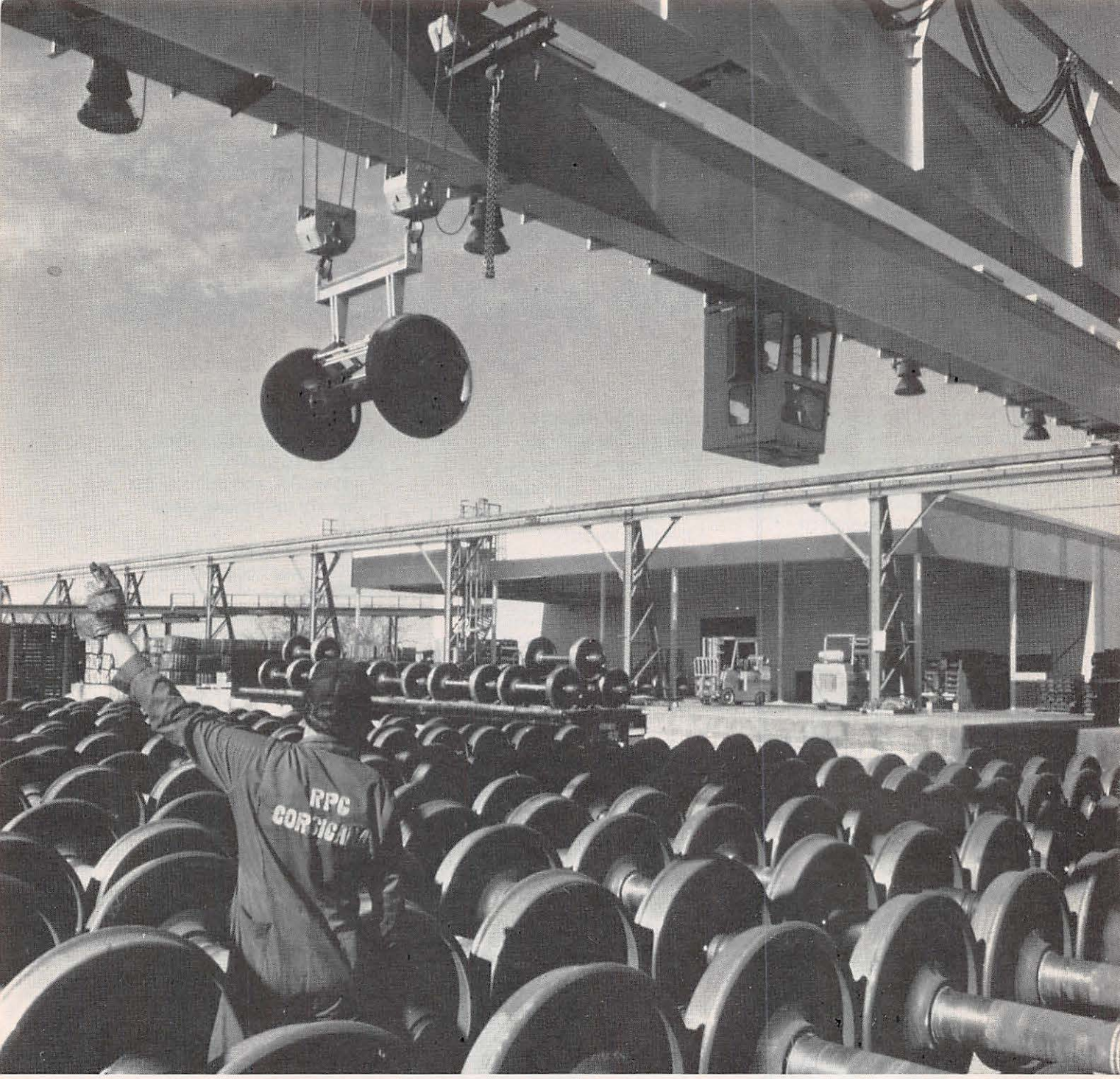

In Corsicana, Tx., Abex "repairs" wheel sets before they're received

At our new Corsicana plant, old wheel sets are taken on an immediate exchange basis, or for repair and return, complete with roller bearings. Under the exchange plan Abex ships you reconditioned sets and picks up your old ones, eliminating turn-around time entirely. Our own wheel cars (loading 46 sets) or trucks (loading 15 sets) can provide the transportation.

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RAILWAY AGE

September 24, 1979

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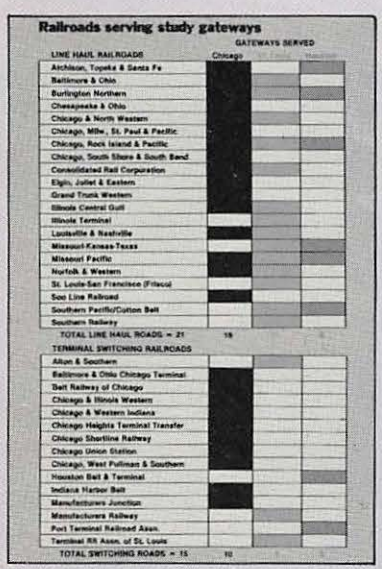

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16 Railroads plug into solar power

Southern was the first to use solar panels to power a grade crossing signal installation. Today a growing number of railroads are turning to photovoltaic cells, which are maintenance free and require no fueling, as a source of energy at points where conventional power is unavailable—including the rear end of a train.

22 Today's choice: Avoid yards—or improve them

The best way to avoid terminal delay is to avoid terminals—but the opportunities for run-throughs, though numerous, are limited. So the FRA, the railroads, and the labor organizations have adopted a Task Force approach to attacking terminal problems. It's now starting to show results.

27 A shipper pays for car repairs—and likes it!

In the Rock Island's sponsorship program, cars are assigned exclusively to the shipper who pays for their repair. This helps shippers to get needed cars, and it has upped RI's return on traffic that has usually been a loser.

32 UP: Profits from recycling damaged freight cars

A $1.6-million investment in improving the safety and efficiency of handling and dismantling severely damaged cars is expected to save the line $4 million in the first year from recycling and reuse of salvageable parts alone.

38 The new look in—and from—cabooses

With bay windows instead of cupolas, trucks that reduce roll and sway, and safe and comfortable furniture, UP's new cabooses seem more like home.

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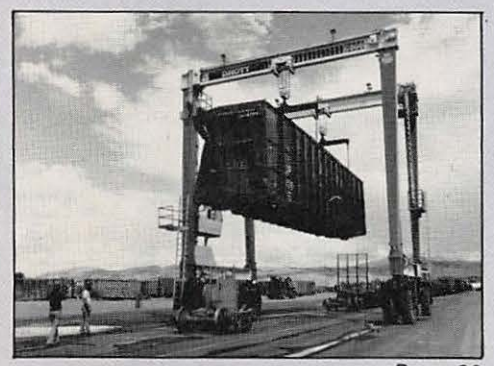

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COVER: Workmen install a solar voltaic cell array atop a Southern caboose to catch free energy for an FRA-required warning light.

ON SOUTHERN RAILWAY, THIS COMPACT CAR

"Guess how far it could travel on a truck."

L. Stanley Crane, President, Southern Railway System, Washington, D.C. 20013

The railroad is the most efficient user of fuel in the transportation industry. Bar none.

And the Southern Railway is one of the most efficient railroads in the country.

For instance, on the Southern, a 3,089 lb. compact car can travel 145 miles on one gallon of fuel. How far could a truck carry it on the same amount of fuel? Well, the railroad is four times more efficient than trucks, 60 times more efficient than planes, and even more efficient than barges. So it's easy to see that trucks can't carry freight anywhere near as far as railroads can per gallon of fuel.

What does this mean for the future? Well, it means that trucks will be used less and less for long hauls.

More and more products will ride on the Southern, and trucks will be used for distribution at the other end of the line. Because, in the coming years, only the railroad will have the energy-efficiency for long hauls.

We have the energy for the long haul.

SOUTHERN

THE RAILWAY SYSTEM THAT GIVES A GREEN LIGHT TO INNOVATIONS

TRAVELS 145 MILES ON A GALLON OF FUEL.

Earnings: A strong first-half comeback

Class I railroads posted ordinary (net) income of $439.3 million in this year's first six months, more than the industry has earned in any full calendar year since 1974. In first-half 1978 the railroads reported a net loss of $13.2 million; for all of 1978 they earned $260 million.

A strong second quarter accounted for most of the gain. In the April-May-June period, the railroads netted $423.2 million.

A major reason for the turnaround was a spectacular improvement in the East, which reduced its deficit from $346.8 million for the first six months of 1978 to $25.9 million this year, on an ICC-accounting basis. In the second quarter, the Eastern District roads showed a profit of $57.7 million.

At the same time, the comparatively rich roads in the South and the West were getting richer: Profits in the South were $156.6 million in the first six months of this year, up from $83.1 million in the same period last year. In the West, profits rose from $250.4 million in first-half 1978 to $308.6 million this year.

In announcing the industry's financial results for the first half of 1979, the AAR pointed out that the return on net investment continues to be low in comparison with other industries. The return for the 12 months ended June 30 was 2.54%, compared with 1.04% in the corresponding 1977-78 period.

Operating revenues for the first six months of 1979 totaled $12.3 billion, up $1.8 billion from 1978. Expenses were $11.7 billion, up $1.4 billion.

Ten railroads operated at a deficit in the first half—four in the East, four in the West, and two in the South. Seven roads showed deficits during the second quarter—four in the East and three in the West.

The industry's performance for the remainder of the year is expected to be considerably less lustrous than in the first half. The recession is being felt with particular severity in the Northeast, and even the stronger roads will be hurt to some degree. Chessie, which will be the first of the Class I railroads to report third-quarter earnings (on Oct. 1), has already warned shareowners to expect a downturn. Said Chessie Chairman and President Hays T. Watkins in a letter accompanying third-quarter dividend checks: "The economic slowdown that started late in the first half continues to affect Chessie and all the nation's railroads. Shipments of automotive parts are down sharply, but there is also a decline in merchandise traffic across the board. Chessie's coal traffic, although not as disappointing, is running under last year's levels, reflecting mainly reduced demand from electric utilities and steel mills."

CLASS I RAILROADS IN THE UNITED STATES
For the second quarter

	1979 (millions)		1978 (millions)
Operating revenues	$6,577.7		$5,758.1
Operating expenses	6,069.8		5,377.9
Income taxes on ordinary income	63.1		70.4
Provision for deferred taxes	70.4		46.2
Net railway operating income			
United States	379.5		269.7
Eastern District	34.2	Def.	29.8
Southern District	104.0		112.9
Western District	241.4		186.5
Ordinary net income[1]			
United States	423.2		234.7
Eastern District	57.7	Def.	16.1
Southern District	131.8		83.4
Western District	233.7		167.4
For the first six months			
Operating revenues	$12,293.7		$10,541.9
Operating expenses	11,665.5		10,286.3
Income taxes on ordinary income	98.6		64.4
Provision for deferred taxes	105.0		58.0
Net railway operating income			
United States	434.9		144.8
Eastern District	56.4	Def.	310.6
Southern District	168.5		161.8
Western District	322.8		293.5
Rate of return[2]			
after provision for deferred taxes	2.54%		1.04%
Ordinary net income[1]			
United States	439.3	Def.	13.2
Eastern District	25.9	Def.	346.8
Southern District	156.6		83.1
Western District	308.6		250.4

Def. = Deficit
[1]Income before extraordinary items.
[2]Rate of return for 12 months ended June 30 is calculated before tax treatment as prescribed in XP 290.

Grain: Shipments up; pressures, too

Through mid-September, U.S. railroads had moved a record 1.381 billion bushels of grain since the spring harvest began in early June, according to AAR figures. Supporting the Herculean effort was a 6.9% increase in the capacity of the grain car fleet. As of Sept. 15, AAR said, railroads were handling 92 million bushels a week, compared with 86.7 million during the big grain year of 1973.

But this wasn't, isn't—and probably won't be—enough. Said the AAR:

"While the railroads expect to continue to haul record amounts of grain, it appears that they will do so in the face of virtually impossible pressures on the overall grain transportation system. These pressures are signaled by U.S. Department of Agriculture projections of a possible record fall harvest with a huge increase in soybean production, coupled with expectations—by grain marketing experts—of a continued strong market, encouraging sale of a large volume of grain still in storage from previous harvests."

Another Agriculture Department statement, however, had railroads even more concerned than did the projections. That was Secretary Bob Bergland's lambasting

of rail management for the "boxcar shortage" (AAR says that as of Sept. 15, the grain fleet comprised 177,223 covered hoppers and 63,530 boxcars).

Bergland apparently overlooked the volatile market that has made the traditional peak-and-valley grain transport situation more peaked than ever. He also overlooked some fairly respectable rail figures. For example, the number of covered hopper cars for grain service was steadily growing so that by mid-September there were, according to AAR figures, 15,461 more hoppers in service than on Jan. 1. There were also about 3,000 more boxcars available, and AAR said more were being kept for grain service than in the past. It all added up to a 5.6% increase in the fleet's numbers in 1979 alone, and an overall capacity increase of 48 million bushels.

The Agriculture Department was not the only government agency making statements about railroads' grain-hauling performance. The Transportation Department in late August urged the ICC to give railroads more freedom in setting rates for grain shipments, especially for export. That would enable railroads to meet grain customers' needs more effectively and to be financially able to buy more cars, DOT said, adding: "Railroads need flexibility and quick responsiveness in setting rates in the volatile world market for grain exports."

The AAR pointed out that the grain transportation system is being strained by a number of factors: (1) a shortage of ships at Gulf and Pacific ports (with embargoes at many Pacific ports) because of a 19% increase in grain exports during the first two months of fiscal 1980, July and August; (2) shifts in the pattern of export movements resulting in longer rail hauls and turnaround times, as Pacific Basin nations have become major grain buyers; (3) a change in crop loan laws and regulations in recent years resulting in a huge increase in on-farm storage facilities, so that farmers following market price changes can release large amounts of stored grain on top of current harvests; (4) high diesel fuel prices causing transfer of some grain shipments from road to rail; and (5) laws allowing truck or barge companies to accept or reject grain shipments so that regulated railroads become "standby" carriers.

Compounding the problem this year was the grain handlers' strike at the ports of Duluth, Minn., and Superior, Wis. Export grain normally handled there was being diverted to other Great Lakes ports, with as much as 2,000 more miles of rail haul. Then there was the Clerks' strike against the Rock Island, a carrier accounting for about 7% of all grain moved by rail in the U.S., according to AAR figures. The Chicago & North Western Sept. 12 claimed that it had already picked up more than 500,000 bushels of grain normally shipped on the Rock Island,

Watching Washington

USRA lays out the options for Conrail

At a time when the federal government is being asked to provide $1 billion in aid to help tide the Chrysler Corp. over some bad times, Congress is showing a heightened interest in how its other big investment in private transportation is panning out. That investment now amounts to $3.3 billion, and it is dedicated to the proposition that Conrail can avoid becoming another Penn Central. There has been increasing talk recently that $3.3 billion won't be enough, and that Conrail will either become a permanent ward of the government or go out of business. So when the United States Railway Association called a news conference Sept. 11 to unveil a long-awaited staff report called "Alternatives for Conrail," the reporters turned out in respectable numbers. What they heard was full of if's and maybe's and on-the-other-hand's—certainly not the stuff that screaming headlines are made of. They did get a thoughtful analysis of where Conrail has come so far (to "a crossroads," said USRA, and for once the cliche seemed appropriate) and of the several paths that now lie open to the railroad.

The flaws of a "firewall"

USRA emphasized that it had not made up its mind as to which of the options it would recommend to Congress in November. USRA's board will decide that only after comments on the staff report are received from interested parties. But it was clear that some of the options are more attractive to USRA than others.

For example, the much-talked-about "firewall" alternative was all but dismissed. This would involve the splitting of Conrail into a western part, which presumably would be profitable, and an eastern part, which wouldn't—in fact, said USRA, the eastern part would suffer losses that would be greater than the whole now sustains. "The benefits of 'firewall'," concluded USRA, "may be substantially less than presumed and perhaps even nonexistent."

"Controlled transfer"—the shift of Conrail's lines and operations to other railroads—was dealt with even more briefly: "Detailed financial projections would require confidential information regarding the operations of other railroads and therefore were not developed."

Business as usual?

The real alternatives seemed to boil down to two: "Continue current operations" and "Improved Conrail." It was apparent that USRA leaned strongly toward the latter.

Under the "Continue current operations" scenario, Conrail would achieve certain internal efficiencies—the same that an "Improved Conrail" would achieve—but the plant would not be reduced substantially in size (this option contemplates only a 700-mile rationalization) and the railroad would labor under existing regulatory restraints. This would mean, said USRA, that Conrail would need an additional $1.3 billion in federal funding through 1983, beyond the $3.3 billion now authorized, which will be exhausted at the end of 1980; and even that would not guarantee long-term viability. (As for a continuation of present operations *without* additional federal funding, USRA President Donald C. Cole suggested that this would result in a Conrail that by 1983-84 would look much like the Penn Central in its last days.)

"Improved Conrail"

An "Improved Conrail," on the other hand, would stand a good chance of becoming financially self-sustaining by 1983. In addition to substantial internal improvements, including better car and locomotive utilization and a lowering of the labor ratio by about 10 points, this alternative assumes approval of railroad deregulation legislation in 1979, to become effective Jan. 1, 1980. It also assumes a major plant rationalization—by 3,700, 4,600, or 6,200 miles on Jan. 1, 1981. (USRA talks about rationalization rather than abandonment because "rationalized track could be made profitable through positive action and retained by Conrail; transferred to other rail carriers; incorporated in short-line operations; operated within the existing light-density lines program; or retained by Conrail with federal, state, or local support.")

Conrail would also need more federal funding under this plan—$850 million if 4,600 miles are rationalized, for example. But the need for direct federal funding would cease after 1983.

The flaw in this analysis, one reporter suggested, is that it now seems all but impossible that deregulation legislation will be approved in 1979. USRA President Cole said this had been taken into consideration, and that a delay of one year would cost about $200 million.

Lines on Labor

GUS WELTY

BETWEEN A ROCK AND. . .

Last year, the Brotherhood of Railway and Airline Clerks picked on somebody its own size, as it were, and BRAC came away bloody, as Norfolk & Western kept right on operating and was steadily gaining strength when, after 82 days of striking, BRAC was bailed out by government, through the creation of an emergency board. In passing, it might also be noted that BRAC's NW strike was hardly the most popular walkout ever called, as members of other unions found themselves getting badly hurt financially in support of a strike called in large part because of "scope," otherwise defined as a union's attempt to force management to be a partner in a recruiting drive. But, of course, other unions—largest among them the United Transportation Union—went along with BRAC (though not to the extent of chipping in when the Clerks' organization itself began experiencing financial difficulties). Now, however, it's 1979 and whereas last year's major labor-management battle could be termed a fair fight, this year's—the BRAC-UTU walkout against Rock Island—looks more like kick-a-cripple time. But (maybe to the surprise and chagrin of the unions) even the cripple tried to hit back, and at the outset it was not impossible to construct a scenario in which the Rock could do what NW had done, *if* the Rock could get over the initial hump of having to pay a lot of bills with only a little revenue coming in.

THE "ISSUES": ARE THEY REALLY THE ISSUES?

Ostensibly, BRAC and then UTU struck the Rock to back up demands for retroactive pay as part of new wage agreements. The road's other 12 unions, most of which signed agreements after Jan. 1, 1978, waived retroactivity, but this didn't appear to faze BRAC and UTU. And yes, perhaps you have to accept "retroactivity" as the issue, because the unions say it is. But if you care to speculate beyond that, you can go for quite a while. For instance, did BRAC leadership figure that it needed a sure-thing victory, after the setback on NW? Or, for instance, did the Rock's go-it-alone success in hammering out, finally, a new work rules agreement so threaten UTU's hold on bargaining and on "patterns" that the union decided to come down full force on this "cripple"? Or, for instance, were the unions simply guilty once more of an inability or a refusal to read the cards? In that context, with also bankrupt Milwaukee Road talking big numbers in terms of employees who may eventually lose their jobs, you might think that labor would ponder carefully before taking action that could also throw thousands of Rock employees out on the street.

IN THE MEANTIME, IT'S NOT A PRETTY THING

A railroad strike—any strike, for that matter—is not a tea party. Sooner or later, you've got to expect a certain amount of what the politicians coyly call dirty tricks, but this sort of behavior usually does come later, after frustrations have had a chance to build and when victory still does not seem near. That, essentially, was the way it was on NW. But it's not been that way on the Rock—which began experiencing a rash of "incidents" almost coincident with the start of the walkout: a bridge burned here, a switch thrown under a train there, thousands of gallons drained from a diesel fuel storage tank out in Kansas, that sort of thing. And, of course (of course?), there have been the phone calls to Rock officers' and supervisors' homes, late-night calls from persons unknown, the most genteel of whom breathe heavily at whoever answers the phone. No, it's not a tea party—but at the same time, the standard phrase is "peaceful withdrawal from service," and maybe somebody, somewhere, should put a bit more emphasis on "peaceful."

most of it in shipper-owned cars.

One railroad, however, remained bullish: Union Pacific, caught up in the rapidly growing westward movement of export grain, was gearing up to run unit trains of wheat to West Coast ports. The trains will be similar to UP's unit grain trains already moving export corn, milo, and soybeans to the Pacific. The trains will be made up from 25- and 50-car units, which can be shared by as many as five shippers in Kansas, Nebraska, Colorado, Wyoming, Utah, and Idaho.

UP was one of several Western District roads showing increases in grain loadings in late August, but its 28% increase was the biggest. In the Southern District only Illinois Central Gulf was up, with a 20% increase in late August. ICG had added 500 new jumbo covered hopper cars since early 1979.

Conrail permitted to impose surcharge

When Conrail announced that it proposed to slap a $280-per-car surcharge on pulpboard traffic originating in Southern Freight Association territory, the National Industrial Traffic League protested vigorously, describing the proposal as an attempt by Conrail "to finesse its divisions of joint rates problems with railroads in the South." Connecting railroads also complained. Family Lines called it "nothing more than an attempt by Conrail to obtain inflated divisions at the expense of its connections."

But the ICC ruled in favor of Conrail, at least temporarily. "After due consideration of the protests . . . we have decided that Conrail's need for additional revenues is such that is should be allowed to implement the proposed surcharge subject to further investigation to clearly resolve all issues relating to its effect on shippers and connecting rail carriers," said the commission—and the surcharge became effective Sept. 1. The ICC had earlier said that it would take a case-by-case approach to Conrail surcharge proposals affecting joint rates.

NTSB wants rules for safety clarified

Regulations that are easier to understand and an expanded program for their enforcement are among recommendations made by the National Transportation Safety Board for safer movement of hazardous commodities. The board based its recommendations on findings that noncompliance was a major element in nearly all of eight serious air, rail, and highway accidents involving hazardous materials that were investigated by NTSB from 1972 to 1977. *(Continued)*

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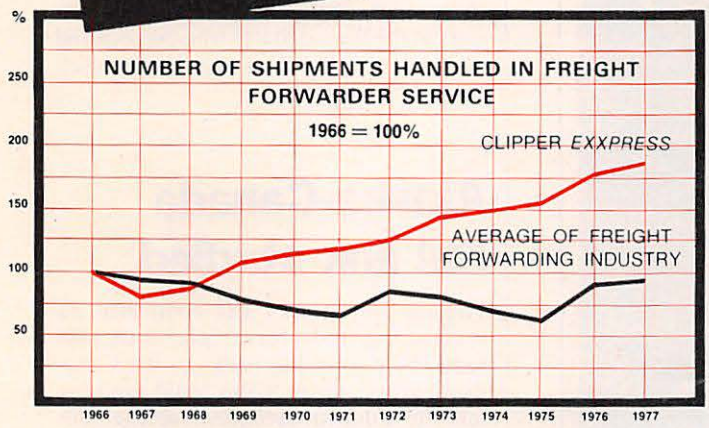

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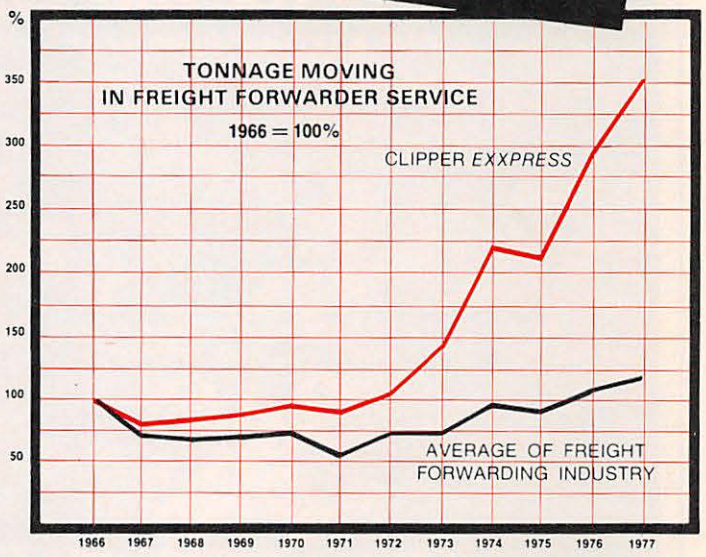

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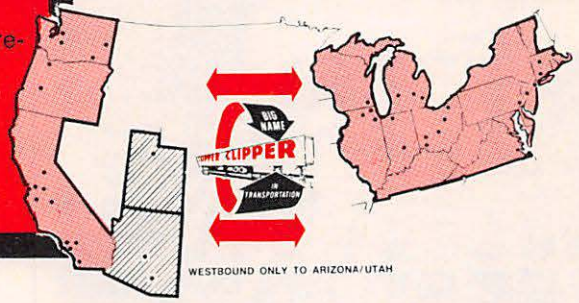

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Why was noncompliance the culprit? The government and the transport industry agree, NTSB says, that there are six main reasons: (1) regulations that are complex and hard to understand; (2) complex industry interrelationship; (3) economic pressures; (4) industry personnel "unaware" of regulations; (5) lack of training for inexperienced personnel; and (6) indifference.

Aimed straight at noncompliance are these four recommendations:

—Expedite the ongoing Transportation Department program of evaluating every hazardous materials safety regulation with the objective of revising each one so that persons needing to follow such rules can understand them.

—Publish all nonemergency amendments simultaneously and at regular intervals, with a cross-reference index including all previously released emergency amendments.

—Expand the Materials Transportation Bureau's compliance program to work through the executives of transport companies for compliance improvement and feedback on the effectiveness of regulations.

—Expand the hazardous materials regulations compliance assurance program by formalizing compliance policies and management systems as a model for other departments with regulatory responsibility, and as a means to measurement capability.

Among the eight serious accidents involving hazardous materials studied by NTSB, only one was on a railroad, but the noncomplying party was found to be the shipper. The "problem area" was identified as "special permit terms; car inspection." However, five railroads were found not complying in a summary of violations in DOT compliance records that covered 44 other less serious incidents.

Though NTSB sees the main need as compliance and enforcement, it also sees another problem: "Since there is no way to determine the quantity and types of hazardous materials that pass through the transportation system out of compliance, it is impossible to measure just how effectively the DOT compliance and enforcement program is working. The success of the compliance with the regulations that is being achieved may be attributed to the conscientious efforts and dedication of both the government inspectors and of those many reputable shippers and carriers in the United States who enforce and obey the law. The noncompliances result from the exceptions."

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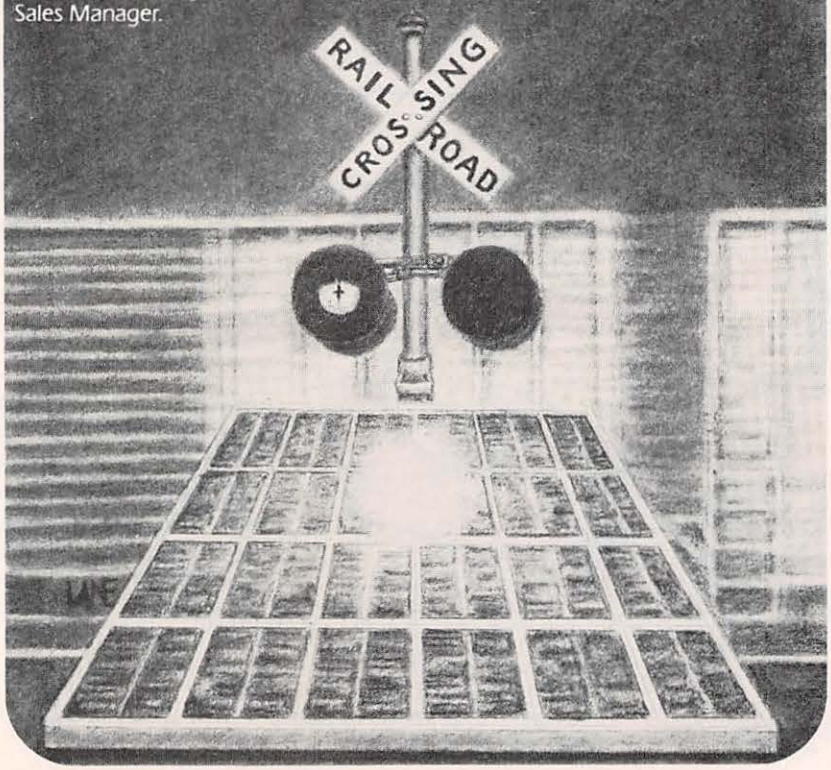

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Alaska-Canada rail link studied

The state of Alaska has completed an engineering study for a 268.5-mile railroad route from Fairbanks to the Canadian border, where tracks could someday link up with a transcontinental line built north from British Columbia. Though no government or private firm has yet proposed to take on construction of such a line, the route study will be used to reserve a transportation corridor now, while much of Alaska's land is still up for grabs.

The proposed route begins in Fairbanks, where it would connect with the Alaska Railroad. From Eielson Air Force Base, it follows the Tanana River and the Alaska Highway, finally veering off into the Ladue River valley to reach Canada. The study called for a 1% desirable grade, with a 1.7% maximum grade.

Most of the route identified by the study crosses state-owned land. "The state Department of Natural Resources will have to classify that land and take steps to acquire any other land along the route," said Bob Thomas, Fairbanks regional planning manager for the Alaska Department of Transportation.

The study was commissioned by the Alaska legislature with an $865,000 appropriation last year. An intergovernmental cost-benefit study is in the planning stages.

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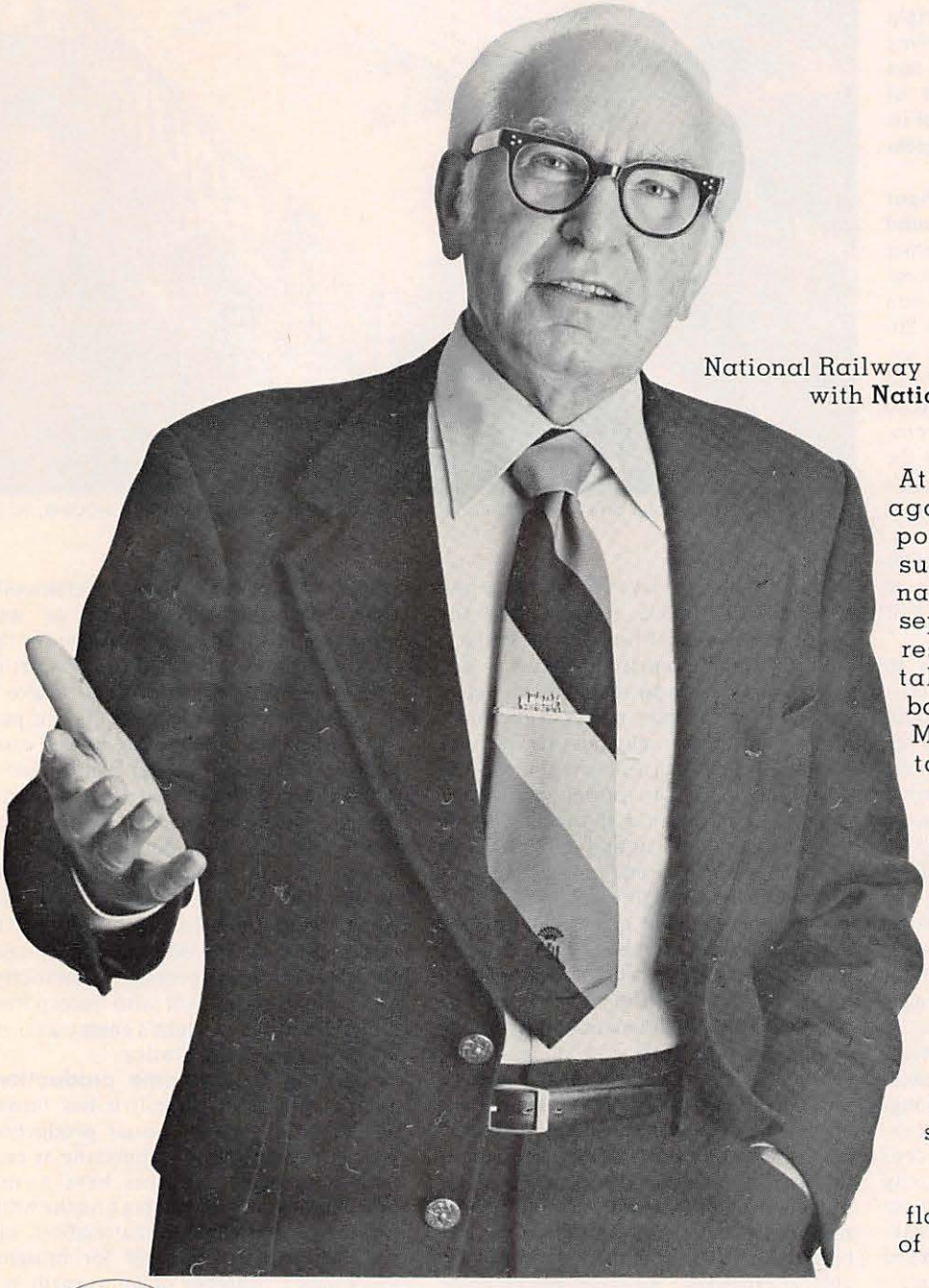

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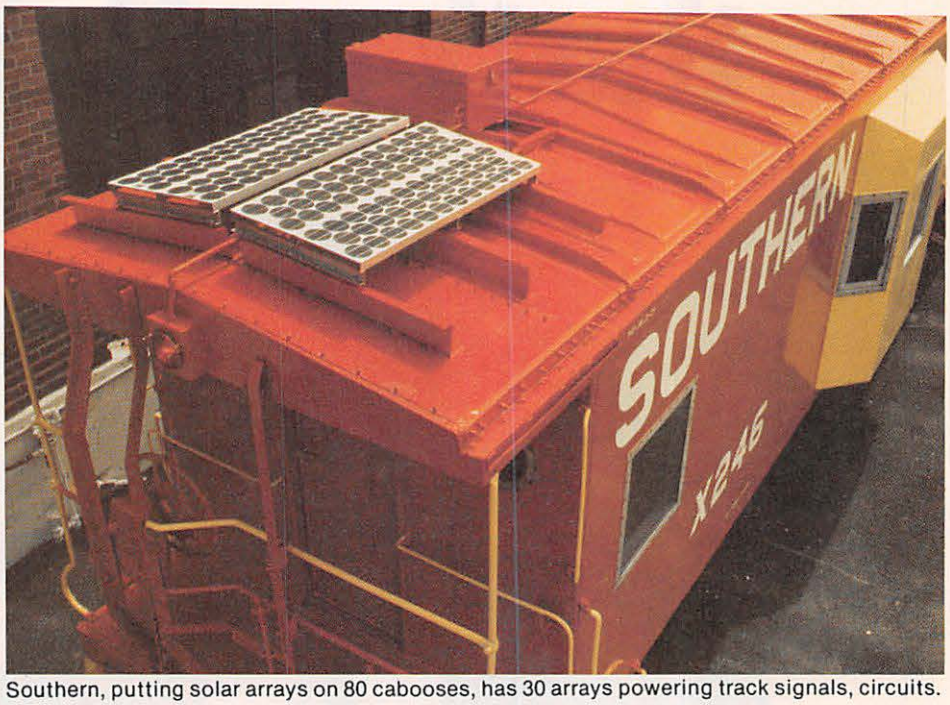
Circle 7 on Reader Service Card

Railroads plug in to solar power

By JOHN H. ARMSTRONG
Associate Editor



Southern, putting solar arrays on 80 cabooses, has 30 arrays powering track signals, circuits.

How much can you afford to invest in picking up four dollars worth per year of free electricity?

When it comes neatly packaged, right where you want it, and with no moving parts, "quite a bit" is the answer—and that's why the solar electric power of photovoltaic cells is establishing one of its stronger terrestrial, unsubsidized beachheads in railroad applications.

Consider the Santa Fe's Defiance Spur signaling, for example. Arizona-bound unit trains of 11,800 trailing tons bring Pittsburg & Midway strip-mined coal from its source in the Navaho reservation near Window Rock, N.M., down a 20-mile spur that joins the main line a few miles west of Gallup. That's no place to have to stop and restart such a consist, so it is important that a distant signal be provided some 6,000 feet in approach to the junction. A coded two-way track circuit can provide home-signal status information at the distant site with no line wires, but there is no commercial ac within miles of the signal, and building a railroad pole line to the site would dominate the cost of the whole installation.

The by-now obvious answer was to generate the required dc (9 watts, average) in solar panels at the location. Even multiplying the average load by the appropriate factors to translate it into the full-sun battery-charging rate required for a high-reliability, 24-hour, all-season system yields a panel capacity that can be bought for much less than the pole line. Now that the cells are on the job, those 80 kilowatt hours a year will be available as surely as the sun rises over the desert, with no maintenance expected for a period that's probably a good deal longer than the duration of the coal contracts.

● **Price: Down, to a point.** Brought out of the laboratory by satellite and spacecraft requirements for lightweight, long-life, price-no-object power supplies of extreme reliability, photovoltaic cells converting sunlight directly into electricity started out in the late 1950s at $2,000 per peak (full-sun) watt. Major breakthroughs in cell efficiency were achieved in the early 1970s, more or less concurrently with the start of the energy-crunch era that helped make apparent some possibilities for large scale terrestrial applications. In its search for potentially significant renewable sources, the Department of Energy crystal-balled the cost goals (see graph) which if attained might ultimately make some dent in our prospective 1990s energy deficit. Adjusted for the inflation which has taken place since the baseline year of 1975, today's prices for silicon panels are not far from the curve.

While many environmentalists approach conversion to the clean and eternal beauties of solar power with something more than religious fervor and something less than full attention to the gritty details, solar power marketers, engaged in the business of sweating out its technical development and application to practical problems, tend to divide its prospective growth into three stages:

—*Remote-location power.* During the era when prices are above $10 per peak watt, photovoltaics will be confined to low-power but critical uses where its freedom from maintenance and fueling overbalance the total cost of such conventional sources as primary batteries or small diesel generators. This is the present era, where such applications as cathodic corrosion-protection systems, mountaintop communication relay stations, extremely isolated habitations—and remote railroad installations—can be attractive because of the even higher costs of available alternatives. As solar prices come down, volume will increase, but dependence on fossil fuels won't be helped. Most of these applications require battery storage to provide continuous power.

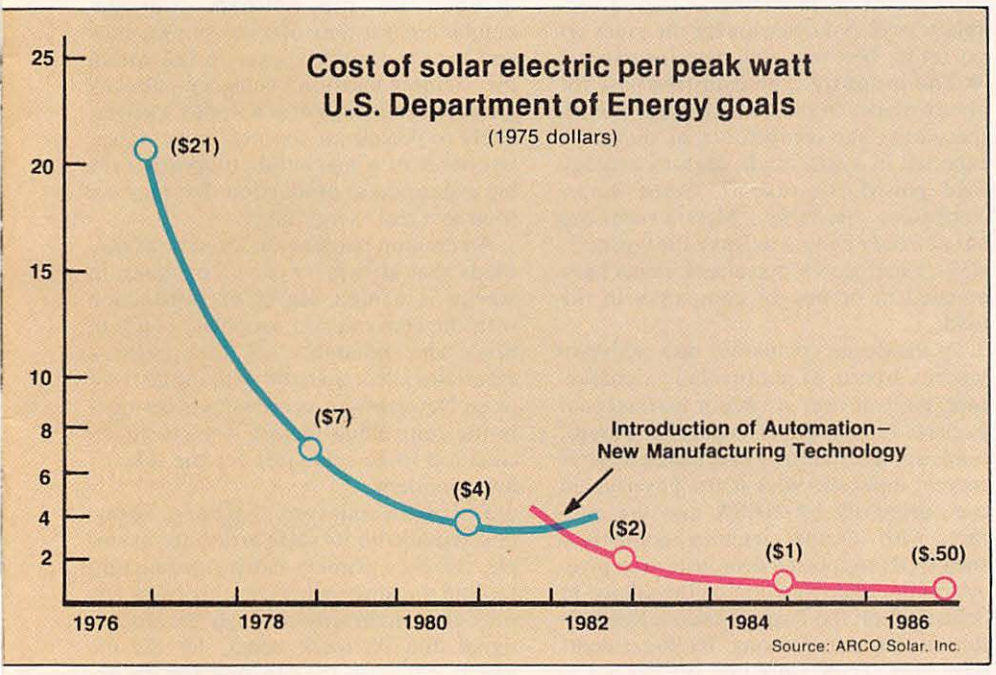
—*Small-scale power.* Within the next few years, when prices get down to the $2 to $5 range, solar electric power will be muscular enough to replace diesel generators of a few kilowatts output. Off-the-beaten-track villages may be efficiently electrified; applications such as well pumping, in which energy storage for the dark hours may take the form of water in an elevated tank, will become attractive.

—*Grid power.* Costs in the 50-cent-per-watt range will make solar power competitive on residential and light industry ac grids now supplied from conventional sources. At this point, the replacement of fossil fuel can become significant, although it will still probably be more economical in most cases to retain existing connections for nighttime power rather than to provide enough storage capacity for solar-generated electricity. Most applications will also incorporate direct use of the sunlight's energy as thermal power for space heating.

● **Getting that volume production.** Considering how difficult it has turned out to be to predict actual production growth in something as mundane as coal (and how many investors have turned blue holding their collective breaths while waiting for the boom to materialize), can you believe any timetable for bringing this exotic technology down to earth in a big way? Technical advances have to translate higher production into lower costs, an industry has to be developed, and customers have to be found and convinced.

Solar electric power today means circular photovoltaic cells sliced from salami-sized single crystals of semiconductor-grade metallic silicon, doped

Seaboard Coast Line has solar-powered track circuits at eight points, including intermediate signals and a radio base station.



and diffused to create the p-n junction surface that generates the electric potential, which is collected by artistic patterns of conductive alloys converging on output terminals. The cells are encapsulated in transparent matrices of nonconductive materials of suitable strength, flexibility, and resistance to an earthly environment and built into a multicell panel that will withstand temperature and humidity extremes, missiles, and other inevitable abuse.

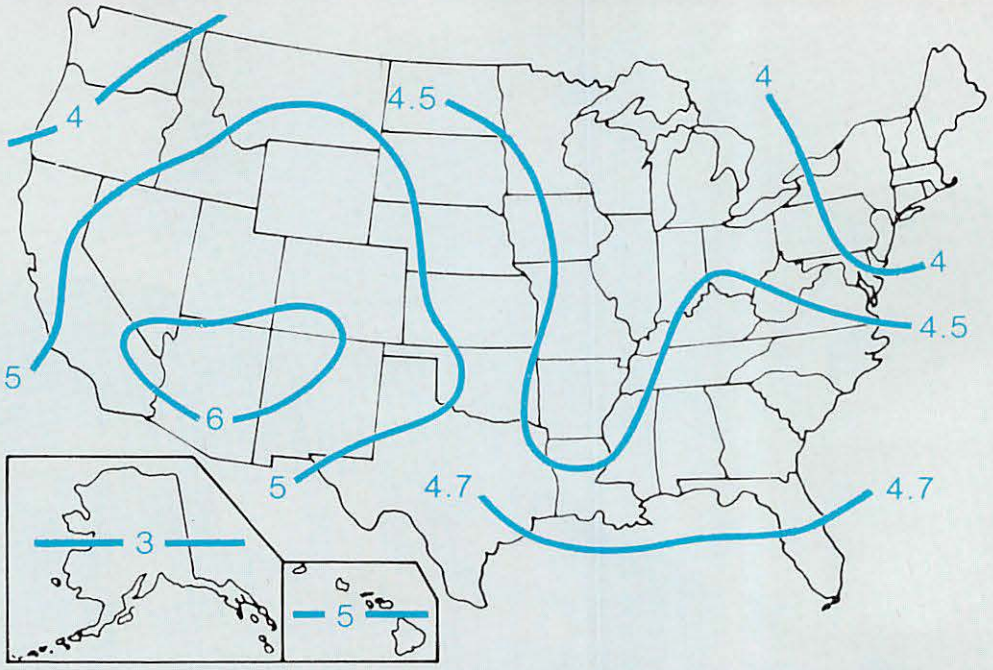
Assembly operations are subject to major cost-saving automation, but the multistep, energy-intensive smelting, refining, shaping, and surface treatment processes transforming the relatively inexpensive quartz raw material into single-crystal wafers as thin as .004 inch must also be continually reexamined for short cuts if the ultimate cost goals are to be approached.

One DOE contract calls for the construction and operation of a 200-kW array to power a Solarex Corp. production line in an average-sun location (Maryland) which will manufacture more panels and thus demonstrate that large-scale systems can in fact be "energy breeders," paying back the "energy debt" incurred in their fabrication in a period enough shorter than their lifetime to represent a net addition to the country's usable energy supply.

Achieving adequate purity with fewer refining steps than those traditionally required in making silicon of the quality needed in minute integrated circuit chips; casting thin wafers directly in a square shape (thus catching the sunlight that misses the present round cells) rather than losing much of the refined material in the sawing process; achieving energy-conversion efficiency comparable to the 12% to 15% of present mass-produced cells with easily fabricated amorphous silicon films —all these paths are being explored, and some will succeed.

Perhaps the most radical approach is that being pursued by Texas Instruments (not currently a manufacturer of photovoltaics) under a DOE contract let in May of this year. TI is putting $4 million of its money in with $14 million from the government; the ambitious target is an ultimate net energy cost of 5 to 10 cents per kilowatt hour (highly competitive

Peak Sun Hours Per Day–Yearly Average



Yearly average peak sun hours per day for locations throughout the U.S. (panel facing south; 45° tilt; no shade)

with utility-delivered energy), to be achieved by a system in which minute spherical silicon cells are produced economically in a fashion analogous to the manufacture of shot. Solar electricity so generated will be used to decompose water, with the resulting gases powering fuel cells for the full-time generation of both electrical energy and usable heat. The contract is unique in requiring a TI payback of the government money, in return for retention of patent rights, should the end result be commercially successful.

Much more predictable are the characteristics of solar electric power which nobody can do much about. "Full-sun" radiation has been standardized at an easy-to-remember kilowatt per square meter, not far from 90 watts per square foot. An array of round cells will put out about eight watts per square foot when perpendicular to the incident rays of full sunlight. Output changes moderately with temperature, decreasing about 25% with an increase from the 25 °C (at which room temperature ratings are specified) to 75 °C (167 °F). Extra-cost square-cell panels provide up to 12 peak watts/square foot.

Individual-cell voltage at peak power is 0.45, so about 36 cells in series will charge 12-volt batteries. Decreases from full-sun light intensity do not greatly reduce output voltage, so a panel will continue to charge its batteries at a rate roughly proportional to the sunlight available. Readily available long-term data on the average hours of equivalent full sunlight on an annual and monthly basis (see maps) can thus be used in determining array size for any application and location.

For a continuous power supply, peak array output must of course be enough to make up for nights and cloudy days—typically from 5.5 times average load in southern desert climes to 9 times in Anchorage. Battery-bank capacity is further dependent upon the degree of protection against power loss in the event of statistically rare long periods of bad weather that is needed for the particular application. Array suppliers have handy-dandy computer programs that will optimize design of a system, including such second-order matters as trading off solar cell vs battery cost in providing a desired reliability level and determining the exact array tilt for best year-round performance.

● **The industry.** The industrial base for photovoltaics in the United States is both speculative and competitive, as should be expected in a still small, high-technology field poised for takeoff. Some major companies (notably McGraw-Edison) have already chosen to leave the business, while a half-dozen petroleum giants have invested in or bought companies in the field.

Of the dozen companies now active in various aspects of photovoltaic manufacture, three or four are major marketers of packaged solar panels ready to mount, hook up, and put to work. Some 80% of current domestic sales is for government use—primarily by NASA and the military, with another segment going into such DOE-supported demonstration projects as the electrification of the village of Schuchuli on the Papago Indian Reservation in southern Arizona. Its 96 residents have been served since late 1977 by a 3.5-peak-kilowatt array that can pump 5,000 gallons of water a day as well as provide limited lighting and refrigeration.

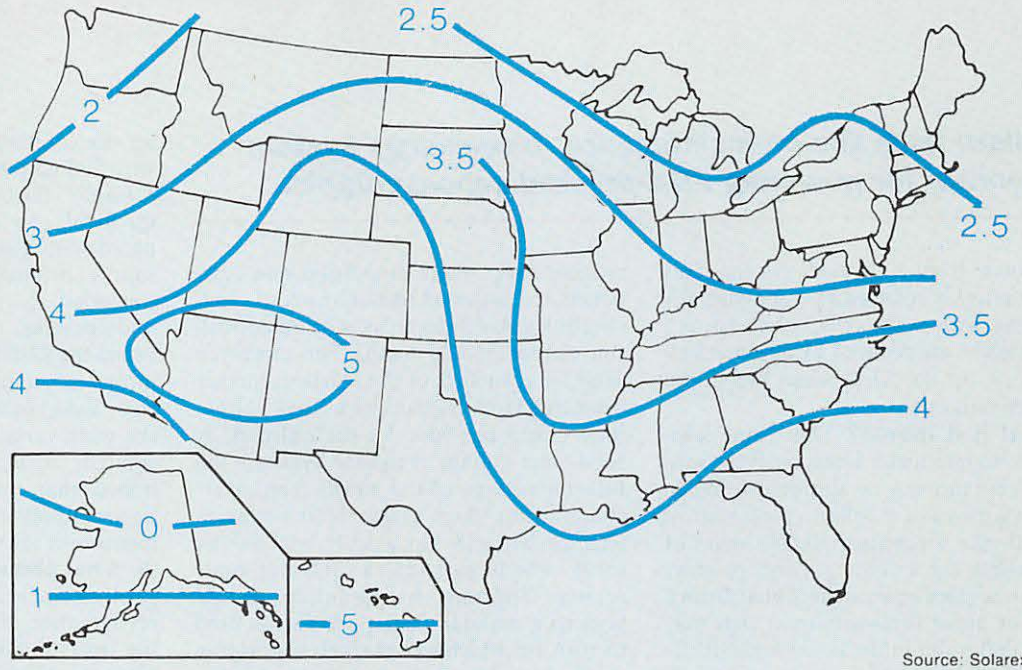
Worldwide manufacturing capacity for 1979 is projected at about 5,000 kilowatts in total, up perhaps 75% from the previous year. Market estimates, which necessarily get fuzzier by the year, predict sales of $100 million within 36 months and a billion dollars by 1992. The latter figure, if coupled with the twenty-fold reduction in price per watt, would represent 2,000 megawatts—when the sun is shining, the equivalent of a couple of Big Alices. In the late 1980s, the combination of widespread use in previously nonelectrified overseas outposts and relatively smaller space/military programs in the United States is predicted to result in an 80/20 ratio of foreign to domestic applications.

● **Back on the railroad.** Railroad-unique applications of solar power, now and for the future, appear to fall within the "remote location" category—already attractive in many cases at today's prices, likely to proliferate as costs come down, but never of a magnitude supporting the big expansion in production that may see solar as a real energy saver.

A common reaction on the several railroads that already have photovoltaics in service is a high degree of satisfaction with the convenience, simplicity, ruggedness, and reliability of the arrays—especially in comparison with the alternatives. Nevertheless, economics is definitely the controlling factor; there is no inclination to go solar just for the sake of living modern.

Just up the spur from that Santa Fe distant signal with its solar array, for example, there's a primary-battery installation feeding the approach-indicating track circuits that, indirectly through the distant signal and its track codes, let the ctc operator line up the junction for the arrival of the coal train. As Assistant Chief Engineer-Signals Bill Hutton points out, for this particular low-drain circuit the battery installation still had a cost edge over a second complete solar power source.

Signaling and communication applications of solar power, starting with Southern's grade crossing installation at Rex, Ga., in 1974 and two Santa Fe radio repeater stations at about the same time,



have more of an experimental than routine or production flavor to date but are building up a body of confidence and experience that may well break loose in step with the planned major expansion of panel manufacturing capacity. Examples:

—*Southern* installed a complete set of crossing flashers, track circuits, and relays powered by solar arrays as a strictly experimental installation at a location where ac line power was available. This provided a heavy enough load to verify the calculated array size (45 square feet) and battery capacity (168 amp-hours) in practice and get a feel for solar's reliability, operating, and maintenance characteristics. While there were minor early problems with encapsulation and factory cell-connection deterioration, results were such as to encourage the railroad to adopt photovoltaic power wherever line power is not readily available. Southern's current tally of solar power sources in service is 30, powering seven intermediate signals and track circuits at 22 different locations.

—*Seaboard Coast Line* has solar-powered track circuits (at eight points, including intermediate signals at two locations and a radio base station). SCL and Southern may differ in the way they see the merger picture in the East, but they report similar experiences with solar arrays: Vandalism is not all that common, but takes the form of stealing the whole array. "We left the anchor fence which had protected the diesel generator set in place after erecting the solar system, and they used the fence to stand on so they could unbolt the panels," recollects Southern's Jack Norris in reporting on the early days of the signal installations along the isolated Lake Ponchartrain crossing.

—*Southern Pacific,* now busy installing ctc between Mohave and Colton, Calif., (including 95 miles of previously dark territory on the cutoff over Cajon Pass) is powering track circuits at 10 different locations with solar arrays; intermediate signals at one point are also likely to go solar. This increasingly busy line will serve as somewhat of a testing ground for SP—three different solar array suppliers and three different types of secondary batteries will be represented.

—*Santa Fe* is currently adding a half-dozen solar-powered communications installations to the two radio repeater stations it has had in operation for five years. Typical 2-GHz microwave installations in the Arizona-Southern California area require 56 to 74 amp-hours per day at 24 volts. Corresponding battery bank capacity provided (at the 100-hour discharge rate) is 500 to 700 amp-hours, or enough to continue operation through a 10-day no-sun period. Communication gear is located underground, with only antennas and solar panels exposed. Santa Fe is using "soft" solar panels, with cells and connections encapsulated but not glass covered. "These bases are in remote locations, but those dune buggies do go anywhere, and a bullet will only knock out one cell in a soft array, leaving the output practically unaffected," says communications chief C.A. Crouch.

"We consider solar power standard for all such new installations; we have lots of ideas for saving money with photovoltaics which we would be putting in if we weren't so busy engineering the new communication gear of all types it is taking to keep up with the computerization of the railroad. A real plus for solar power is the reduced lightning damage hazard to the communications equipment that comes from its total isolation from power lines."

● **Moving north.** As you'd expect, Sunbelt railroads are the primary present practitioners of solarization, but this may be almost as much a matter of where the facility expansion is taking place as it is of average hours of effective sunlight; traditional signal equipment lifetimes are such as to concentrate new installations where the traffic is growing.

G.W. Thompson, Burlington Northern's chief engineer for signaling and communications, reports that shorter periods of daylight have been no detriment to its selection of solar power as the standard for all intermediate signal and track circuit installations currently under way where commercial line power is not readily available. Following a few experimental primary-battery replacements in Nebraska and Missouri to gain experience, BN made the decision to go solar rather than construct any company-owned ac lines in extending ctc to its new or previously dark routes in Wyoming and Nebraska as they are being readied for the ever-increasing coal traffic. Installations approach the 45th parallel. "We don't have a specific program for replacing existing primary battery power with solar at this time, although we have many miles of such territory, but there's no doubt that we will go that way whenever we can."

Solar isn't the only candidate for cost-efficient remote power generation where loads are smaller than those traditionally handled by small diesel generator sets. Windmills get away from fueling requirements, while thermal electric generators (TEG's) catalytically burning propane, butane, or natural gas and converting heat directly to electricity by the Seebeck (thermocouple) effect offer "no moving parts" simplicity and reliability. TEG supplier Teledyne Energy Systems, which markets units putting out from 10 to 90 (continuous) watts, suggests that in some cases high reliability at minimum total cost

Southern finds the no-maintenance, free-energy system economical for powering FRA-ordered caboose lights.

may come from a hybrid system. Gas consumption is reduced by supplying the base load with solar cells, while battery requirements are reduced by automatically starting up the TEG when the stored sunshine runs out.

● **What if it moves?** That same kilowatt per square meter lands on every sunlit surface, moving or stationary. When solar gets down to a dollar a peak watt, it will still take more than 10,000 hours of full sunlight for a dollar's worth of array to generate juice equivalent to that from a gallon of diesel fuel—whatever *that* may cost at that point in the history of OPEC. Diesel power doesn't come cheap in small packages, though—even if it's picked off a car axle. Now, the requirement of the Federal Railroad Safety Authorization Act of 1976 (P.L. 94-348) that a warning light be displayed toward the rear of all trains has reopened the question: What is the most economical source for a small amount of power on a moving vehicle, all costs considered?

Passenger cars and road-service cabooses with electrical power already at hand for other purposes pose no problem. What about local-service cabooses, where low-power battery radios suffice, running times are short and highly intermittent, and operation is typically from small yards with minimal logistic support facilities?

FRA implementing regulations (as they have settled down after the usual proposals, challenges, and litigation) require a continuous or equivalent flashing light of 100 candela intensity, of specified beam height and width, and within the red-orange-amber part of the spectrum. The source may be active or passive, but so far no one has elected to provide a locomotive headlight/caboose reflector combination doing the job by the passive route.

Southern has 80 such cabooses—steel, bay window cars with friction bearings not conveniently adaptable to end-of-axle generator drives. Solar power having made its mark in C&S applications, the railroad looked with favor on it for this application. The first of a dozen experimental installations (using panels from four different suppliers) was in service by September 1978. The scheme worked, so the road is now installing 68 production sets at a rate of three a week as the cars go through its Hayne Car Shops in Spartanburg, S.C., for their regular four-year overhaul cycle.

Business end of the Southern installation is a McDermott marker unit with 12-volt, 18-watt GE sealed-beam lamp and red lens cover. Four Arco-Solar A16-1200 panels are mounted flat on the roof, constituting a 4x4-foot array with rated full-sun output of 128 watts. The tempered glass front surface of the panels is further protected from impacts by a "hat" of ¼-inch Lexan provided by the railroad. A solid-state voltage regulator prevents the full-sun voltage of the panels from overcharging the three Delco 1150 no-maintenance batteries (in a steel box on the roof) which provide a 360-amp-hour reserve. The only wiring inside the car goes to a manual, center-off switch used to turn on whichever marker is pointing rearward; with 10 days of battery, occasional forgetfulness is no catastrophe.

On the basis of experience with the earlier installations, Southern is confident that applied sunlight will keep the cabooses legal with no maintenance between shoppings other than the normal washing they receive as part of their servicing as they are cycled through bases at Macon, Chattanooga, Knoxville, and Linwood at 90-day intervals. Arrays are mounted at the opposite end of the car from the smokestack (Southern cabooses are already independent of imported fuel, being heated by coal stoves) and have shown no more than 6% loss of peak charging current from dirt accumulation between scrubbings.

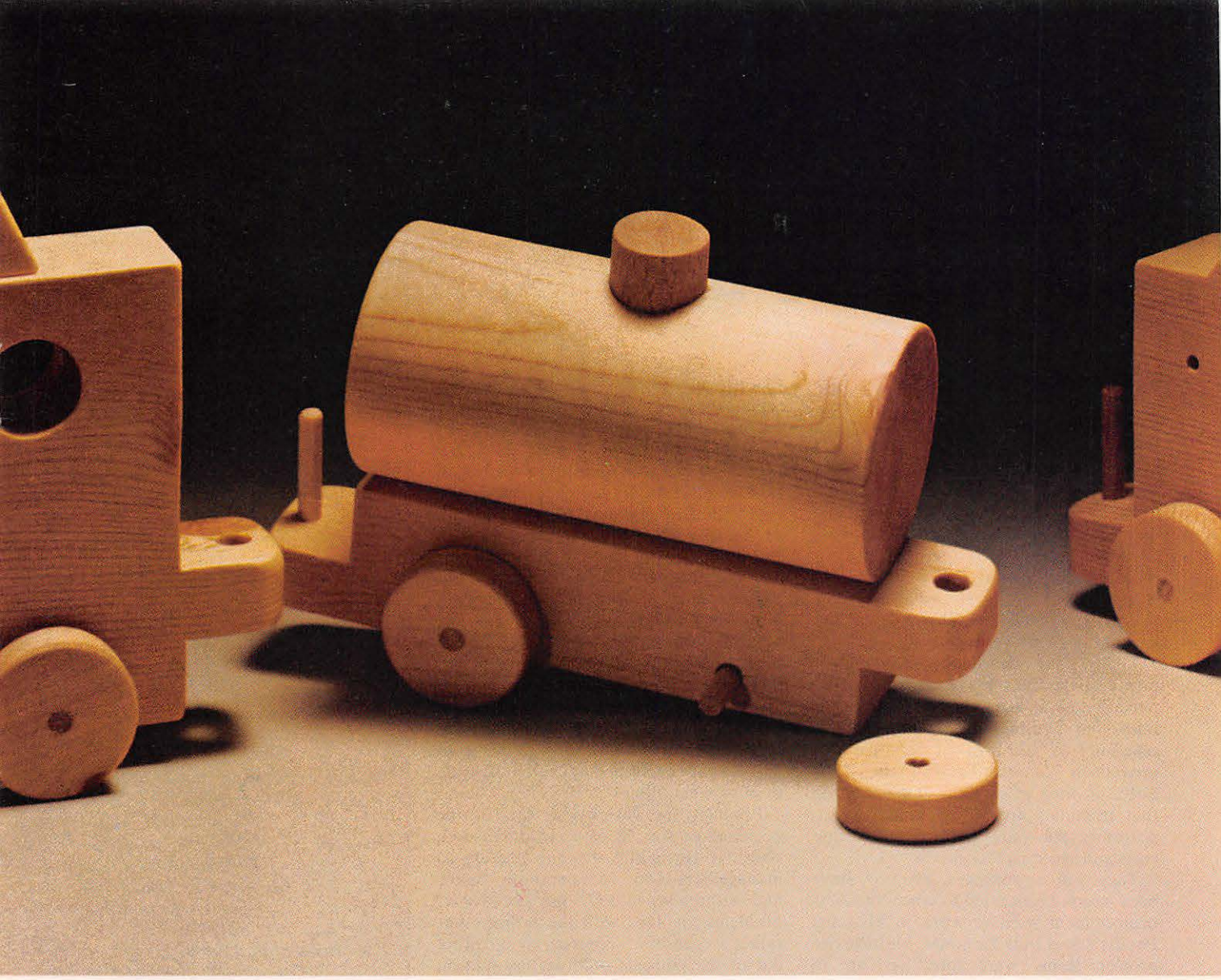
While the cost-effectiveness of the FRA light as an accident preventative may be undemonstrated, Southern can't help but be pleased with the relative economics of this approach toward meeting the requirement. At a total installed cost of about $2,000 ($1,280 of which is for the panels), system electrical engineer Coleman Harvey says the no-maintenance, free-energy system is well below the cost of a typical generator drive system alone.

● **Seeking the minimum-cost system.** Somewhat closer to the North Pole, the Norfolk & Western has had four of its local-service cabooses equipped with experimental solar-powered markers since early 1979. Two have packaged marine-beacon power supplies from Tidewater Signal, while two are charged by arrays consisting of three Solarex 4200 JG Unipanels generating 66 peak watts. The equipped cabooses are working out of Shaffer's Crossing, Carbo, and Wilcoe in the Virginia-West Virginia area, neither the sunniest nor the cloudiest locales on the railroad. N&W General Manager-Motive Power and Equipment H.L. Scott, Jr., considers the alternatives of throwaway batteries and solar panels still very much in a contest; to get a real handle on minimum cost possibilities under service conditions, the three-panel system with 500-amp-hour battery bank feeding a 1.1-amp flashing incandescent marker (probably an overdesign) will be compared with a single-panel, 360-amp-hour supply driving a 0.5-amp strobe light (intended to represent somewhat of an underdesign). With the differences between the $280 long-life strobe and the $36 incandescent no minor part of the total cost, the choice can go either way. With the wide variations in effective hours of sunlight within N&W's territory, it is hoped that two different capacities of power supply will suffice to cover requirements over the whole system.

● **What about bigger loads?** A typical pool-service caboose with gas heat and refrigeration may have a radio and lighting load of 250 to 300 watts maximum, often supplied by one of several types of axle-drive/generator units, frequently of much greater capacity than needed and less than fully satisfactory from both cost and maintenance standpoints. Assuming an average load of 120 watts, at today's prices it would take $9,000 worth of horizontal panels to do the job in Southern California, $16,000 worth in the Great Lakes region. Panel area of 150 to 250 square feet doesn't require lengthening the caboose, but battery capacity in the range of 3,000 to 15,000 amp-hours remains an unattractive feature even if the price of photovoltaics drops by the predicted factor of 10 or 20.

Similarly, a detailed study of solar power (reported in *Transportation Research Record* 653, Dec. 1977) for mechanical refrigerator cars by D.R. Conover of Fruit Growers Express indicated rather marginal practicality under present conditions. Panels paving the entire roof of a 60-foot reefer could power the 2½ tons of refrigeration necessary to *maintain* the temperature of a precooled load of fresh produce (the respiration heat input of a load of such heavily "breathing" crops as sweet corn is as much as four times that coming through the car's insulation and from the air circulating system) while the sun is shining; looking ahead to $2-a-watt cells would indicate that solar arrays might be cost competitive with the rather expensive diesel sets now used and their fuel over a period of a few years, but the typical 10-ton fossil-fueled unit has capacity to cool a load down rapidly without depending on plug-in lineside power. The solar-powered cars would be a modern way to meet prospective EPA acoustic standards!

Solar power *is* finding a market on the railroad—those 10 kilowatts going into Southern's cabooses would have represented more than one percent of all of last year's nongovernmental sales—but having to fight for every watt. ■



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NORTH AMERICAN CAR

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Today's choice: Avoid yards —or improve them

By GUS WELTY, Senior Editor

Back in the 1960s, *Railway Age* had a regular feature called "Operation Speedup"—and the headlines on those stories became a cliche, almost an in-house joke. For example, a headline might read "Pre-blocking Cuts Costs, Speeds Freight," or perhaps "Run-throughs Cut Costs, Speed Freight"—with "basic" changes accounted for mainly by whether the subject demanded singular or plural verbs.

Today, the continuing accomplishments of the Task Force on Rail Transportation could also produce cliche headlines—but without any joking around, especially in the area of terminal improvement stories, because the Task Force is time after time demonstrating that terminals are indeed lands of opportunity for—you guessed it—cutting costs and speeding freight.

Task Force-sponsored projects have been around since 1973, when the first project team went to work in Missouri Pacific's St. Louis Terminal. Multicarrier project teams were later set up in Chicago, Houston, St. Louis, and this year in Portland, Ore. Among the recent accomplishments the Task Force can point to:

—Completion, in 1978, of a series of experiments designed to improve interchange of empty cars in St. Louis through the exchange of advance information between carriers. Benefits in this area are estimated at between $500,000 and $1 million a year, and, the Task Force notes, "wider application—to all roads in St. Louis or to the industry nationally—would significantly increase these benefits."

—Completion of a major experiment in Houston with regard to improved handling of empty private cars, with the benefits to Houston railroads estimated at $250,000 year and, again, with "further benefits with wider application."

—Development of 12 experiments involving improved interchange of cars between carriers, with potential car-utilization benefits approaching $1 million a year.

—Improvements in the efficiency and the rail industry's use of a Terminal Performance Measurement System (TPMS) that provides carriers in multirailroad terminals the information needed to monitor car movements through the terminal.

—Adoption of the project team approach by rail management and labor in Buffalo and in Vancouver, B.C., and completion of planning for the addition of the new Task Force project team in Portland.

● **Four targets.** The Task Force's objectives for its project teams have always been fourfold: (1) to improve speed and reliability of rail service, (2) to improve the productivity of both capital and labor, (3) to generate additional business, and (4) to encourage greater cooperation between management and labor and between and among railroads—all of this to happen with benefits that exceed the costs of implementation.

Progress, the Task Force says, can be documented for '78 with respect to each objective (including the one relating to management-labor cooperation; labor had withdrawn in 1977 not because of problems involved with the projects but rather because of controversy growing out of the national contract negotiation situation at that time, but labor resumed its participation last year at the project team level).

● **Results.** Taking the four basic objectives one by one:

—Speed and reliability are the service elements as considered in the TPMS, with speed measured by the average elapsed time for car movements and reliability gauged by the percentage of moves completed successfully within given time parameters. A dozen interchanges looked at by project teams in the Chicago, Houston, and St. Louis terminals were judged to have substantial possibilities for improvement. As a result, experiments were developed that would reduce the average elapsed time for car movements by 74,000 hours per week, an overall improvement valued at about $1 million in car-utilization savings.

—Experiments in advance information exchange between carriers and in improved handling of private cars showed potential for significant reductions in empty-car cycle times. The benefits of these reductions were estimated at $750,000 per year (using current per diem rates); if replacement costs were factored in, savings to the involved railroads from these empty-car experiments would be closer to $1.5 million a year. In five of the 12 interchanges studied, labor productivity could also be improved through redesign of interchanges to eliminate empty back hauls on transfer assignments.

—Business-generating possibilities have been most obvious in the Task Force's intermodal service demonstration project—the Chicago-Twin Cities "Sprint" piggyback trains operated over Milwaukee Road. But terminal experiments have also generated considerable interest among shippers, the Task Force notes, especially in connection with the handling of empty private cars and with an improved-interchange experiment conducted in the Chicago area.

—As for the "communications and cooperation" aspects of the Task Force approach, management-labor cooperation is on the way back, and project teams

Run-throughs:

In the railroad industry's drive to make, not just to meet, competition, perhaps the most dramatic-appearing change has come with the advent—and the subsequent fine-tuning—of run-through train operations, operations based upon the logical premise that the best way to avoid delay is to avoid yards.

Evidence of that logic? It could probably be found at virtually any yard or terminal, with even a rudimentary monitoring of car movements. It *was* found—in stark and disturbing detail—in a special study made in Chicago by a Task Force on Rail Transportation project team. Among the findings: (1) While 36% of the cars moving through the terminal required only one yarding, 34% had to move through three or more yards and 12% were yarded five or more times; and (2) cars yarded just once moved through in an average of 27.5 hours, but cars requiring three or more yardings average at least 62.8 hours, and the time jumped to more than 104 hours for cars yarded six or more times, with the average for all cars working out to almost 48 hours.

Chicago being what it is, true "run-through" opportunities are hard to come by, and the emphasis has had to be on improving interchanges, running "through" as far as the receiving road's yard, and getting more productivity out of transfer movements.

● **"Intact' long hauls.** Elsewhere, however, the run-through concept has flourished to a greater extent, with a number of long-haul operations in which trains

Cooperation for more compete-ability

UP and two MoPac diesels with freight at Kansas City. Active in promoting run-throughs, UP has 11 agreements, the latest with Katy between North Platte and Denison, Tex.

are kept intact to the greatest extent possible, with motive power and cabooses running through and with "delay" in large part accounted for by such necessary items as inspections and crew changes.

And there is, in fact, one brand new operation which even solves the "Chicago problem," a transcontinental piggyback run-through involving Conrail and Santa Fe, with fifth-morning delivery schedules to be maintained westbound and sixth-morning eastbound; interchange between the two roads takes place at Streator, Ill., about 90 miles southwest of Chicago.

Even a fast scan of recent schedules gives a reasonable idea of the scope of the run-through, a scan that will turn up such operations as Waycross, Ga.-North Platte, Neb., via Seaboard Coast Line, Frisco, and Union Pacific; Birmingham-Houston, via Southern and both Southern Pacific and Missouri Pacific; Detroit-Kansas City, via Norfolk & Western and Santa Fe; a Southeast-West Coast haul via Frisco and Santa Fe, along with a similar operation involving MP and Santa Fe; Jacksonville-Houston, via Family Lines and both MP and SP; Jacksonville-Pine Bluff, Ark., via Family Lines and Cotton Belt, and East Coast-Pine Bluff via Chessie System and Cotton Belt; Waycross-Little Rock, via Family Lines and MoPac and Sheffield, Ala.-Little Rock, via Southern and MoPac; Atlanta-Toledo, via Southern and Chessie; a north-south operation along the West Coast, via Burlington Northern, Western Pacific, and Santa Fe; Pittsburgh-Kansas City, via Conrail and Santa Fe; and a couple of other operations involving BN and southeastern carriers, Galesburg-Nashville with Louisville & Nashville and Galesburg-Louisville with Southern.

Add in the increasing number of unit coal trains which move to destination over two or more carriers, take into account through operation of dedicated TOFC/COFC trains (among them Chicago & North Western's "Falcon" trains operated in conjunction with UP), and the numbers begin to be impressive, perhaps reflecting nothing as much as they reflect the fact that interroad cooperation is one of the most effective weapons at hand in the competitive battle.

● **But if you can't run through ...** Applications of the run-through principle are, however, obviously somewhat limited—by traffic volumes, traffic patterns, and so forth, and run-throughs will solve only a part of the industry's problems with reliability and speed of service.

Much less limited are the opportunities for improving the flow of both loads and empties through yards and terminals, opportunities which various elements of the Task Force on Rail and Transportation have been uncovering at an encouraging rate at a number of major points.

(working, necessarily, on intercarrier relationships for most of last year) have been able to show results from several experiments, especially those conducted in St. Louis on advance exchange of data on empty-car movements. In addition, new interest has been generated in terminals outside the scope of Task Force operations, notably in Buffalo and Vancouver where management and labor have set up programs that follow the project team model but are not affiliated with the Task Force. In the meantime, another Task Force-sponsored project team did begin operations at Portland in April 1979, and Kansas City is a leading candidate for the next project team approach.

In the whole Task Force approach, one thing is crystal clear: The Task Force isn't afraid of challenges.

● **Broadening the coverage.** In the beginning, there was just the MoPac St. Louis Terminal project—one railroad and 1,800 employees. Now, by contrast, there are projects that have been working in Chicago and Houston as well as the expanded project in St. Louis, and the numbers read something like this: Chicago, 26 railroads and 30,000 employees (along with 475 labor committees); Houston, eight railroads and 5,000 employees; St. Louis, 17 railroads and 12,000 employees. As the Task Force puts it, "when the Task Force moved to multicarrier terminal operations, the importance and complexity of both labor involvement and communications increased."

Basically, the Task Force notes, "all experiments and studies act toward improving interrailroad coordination and communications." But there are barriers that have to be hurdled:

"One is the competitive and interdependent nature of the industry. The Task Force has addressed this barrier by maintaining multicarrier membership, by encouraging the use of advisory committees that represent all involved carriers, and by stressing the need to improve industrywide performance.

"Another barrier has been the lack of data on car movements throughout a terminal. The TPMS enables carriers to see the movement of cars not only on their own road but throughout the terminal area. The data system's output serves to emphasize interdependence and to point out areas where car utilization and service quality are adversely impacted by lack of coordination and communication. [Carrier cooperation in this area, the Task Force says, has been excellent, with all major carriers in the three terminal areas except Rock Island providing data to the system; data is processed by the AAR and "carefully handled by the project teams to maintain confidentiality."]

"An additional barrier has been the

Railroads serving study gateways

LINE HAUL RAILROADS	GATEWAYS SERVED Chicago	St. Louis	Houston
Atchison, Topeka & Santa Fe	■		■
Baltimore & Ohio	■	■	
Burlington Northern	■	■	■
Chesapeake & Ohio	■		
Chicago & North Western	■	■	
Chicago, Milw., St. Paul & Pacific	■		
Chicago, Rock Island & Pacific	■	■	■
Chicago, South Shore & South Bend	■		
Consolidated Rail Corporation	■	■	
Elgin, Joliet & Eastern	■		
Grand Trunk Western	■		
Illinois Central Gulf	■	■	
Illinois Terminal		■	
Louisville & Nashville	■	■	
Missouri-Kansas-Texas		■	■
Missouri Pacific	■	■	■
Norfolk & Western	■	■	
St. Louis-San Francisco (Frisco)		■	
Soo Line Railroad	■		
Southern Pacific/Cotton Belt		■	■
Southern Railway		■	
TOTAL LINE HAUL ROADS = 21	16	14	6

TERMINAL SWITCHING RAILROADS			
Alton & Southern		■	
Baltimore & Ohio Chicago Terminal	■		
Belt Railway of Chicago	■		
Chicago & Illinois Western	■		
Chicago & Western Indiana	■		
Chicago Heights Terminal Transfer	■		
Chicago Shortline Railway	■		
Chicago Union Station	■		
Chicago, West Pullman & Southern	■		
Houston Belt & Terminal			■
Indiana Harbor Belt	■		
Manufacturers Junction	■		
Manufacturers Railway		■	
Port Terminal Railroad Assn.			■
Terminal RR Assn. of St. Louis		■	
TOTAL SWITCHING ROADS = 15	10	3	2

lack of an organization which has multi-carrier responsibility and a staff to examine terminalwide operations from an industry perspective—the basic service that the project teams provide."

● **Empties and interchanges.** Empty-car and interchange experiments were the major activity areas for project teams last year, and the Task Force summarizes results this way:

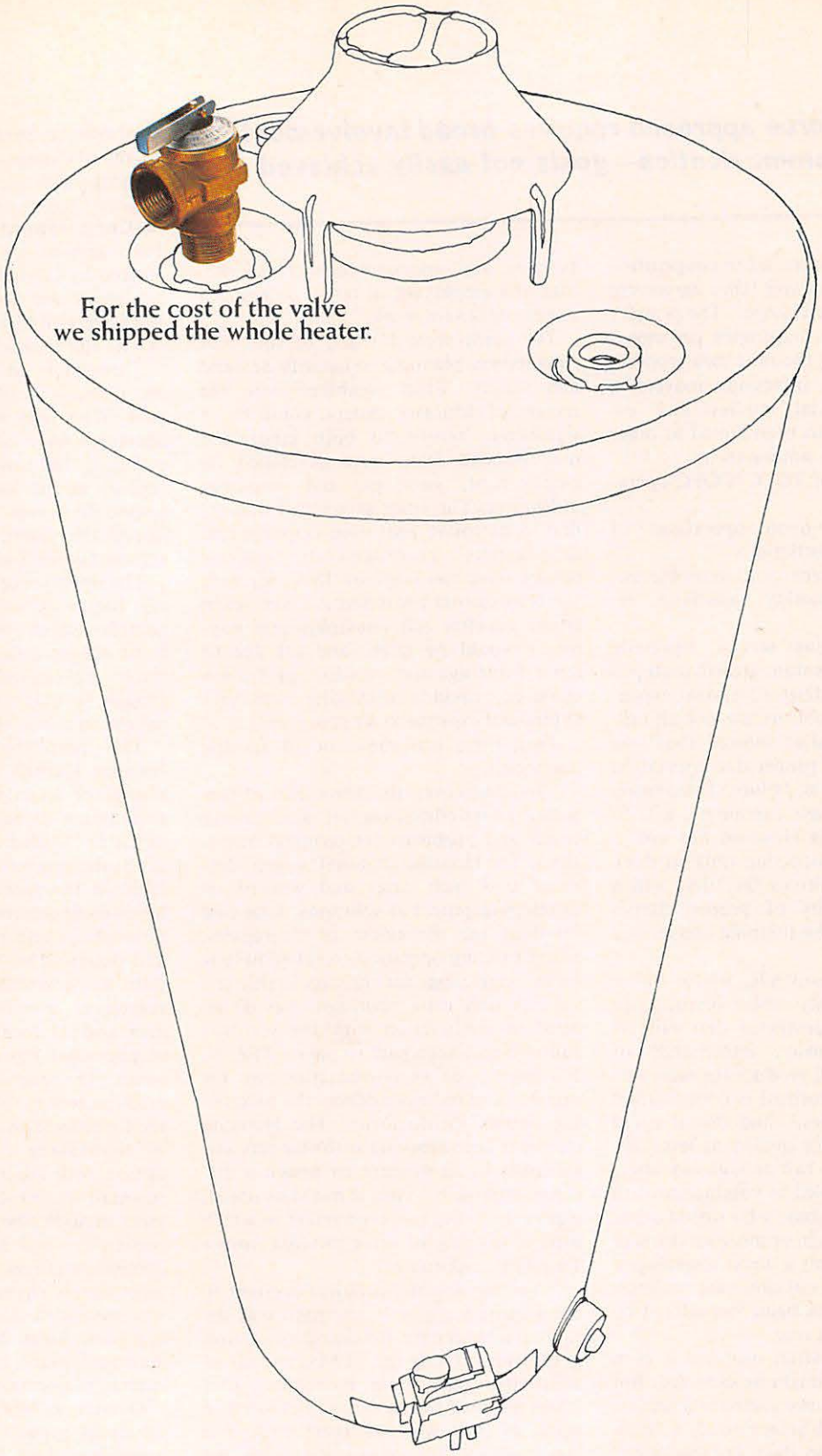
"Experiments with improving the handling of empty cars, both railroad-owned and privately owned, demonstrated a particularly fertile area for industry action. The savings generated by the experiments, if they were adopted by the industry, would be more than $1.5 million even on the limited scale employed in the experiments. The costs of experimentation were small. The results warrant a close examination by the industry to determine the value of broader application, possibilities for computer application and, given the cost of capital and the importance of improving freight car utilization, the relevance to industry capital needs and revenue-generating potential.

"The common thread running through the empty-car experiments is information exchange between carriers and the use of that information. St. Louis and Houston experiments combined information exchange, communications, and management attention to the handling that cars received. The benefits were generated through insuring that information was timely, that the information used was correct, and that action was taken on the basis of the available information. The experiments demonstrated that in the area of empty-car handling, such actions could produce sizable benefits at little cost. The experiments in Houston are now management practice, the St. Louis experiments have generated efforts to extend information exchange. But broader application is needed geographically. Finally, the experiments indicate a small part of what a broader exchange of information between carriers . . . might be able to produce for the industry."

As for interchange arrangements, project team experience with experiments "demonstrates the complexity of the established practices that impact terminal movements. The experiments undertaken or proposed, in combination, would, if adopted by the carriers and labor, produce savings in car-days valued at almost $1 million annually, plus other benefits in improved service, crew and locomotive utilization, and in reduced capital requirements. Of the 12 interchange experiments discussed, eight were implemented as experiments. By the end of 1978, two had been adopted by management and labor as a regular part of operations. . . .

"The experience with interchange procedures has produced a number of benefits in terms of improved understanding of the car-movement process in terminals. A major benefit has been the demonstration that the TPMS can in fact pinpoint areas requiring attention, suggest approaches to improvement, and permit the establishment of car-hour savings targets and the measurement of results. A second benefit has been that in the cases studied it has been demonstrated that although carriers can change interchange procedures, they are often prevented from doing so because of the complexity of the process and a lack of data. These findings strengthen the conclusion that a staff with an industrywide perspective is useful to develop possibilities of improvement and serve as a catalyst for change. A third benefit has been the demonstration of the important role terminal carriers play in overall performance. Eight of the 12 interchanges studied involved terminal switch carriers. Finally, the experience with interchange movements has permitted the teams to establish priority movements for investigation and possible experiments using the TPMS. These priority lists are being used for planning team operations in 1979 and 1980."

● **Other problems on the list.** Experiments up to and including 1978, the Task Force notes, have focussed on "coordination between carriers, facilitated by information development and exchange



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The Task Force approach requires broad involvement and good communication—goals not easily achieved

and, in some instances, labor cooperation and willingness to waive labor-agreement restrictions on interchanges. The primary focus has been on improving car movements by reducing the time cars spend in terminals and on increasing movement reliability." Special studies and experiments have also been aimed at other terminal problems, among them:

—The growth of TOFC/COFC operations.

—The impact upon operations of seniority district restrictions.

—Crew assignment location problems.

—Specific-commodity handling requirements.

In trailer/container service, especially in growth-area Houston, growth itself has created problems despite terminal expansions—but the problems are not all railroad related. Studies showed that you could add lack of proper documentation on import shipments, failure of steamship companies to release containers, a U.S. Customs policy (in Houston but not in other ports) of inspecting only at dock rather than at railroad facilities, and a lack of availability of proper chassis (which are owned by shipping and leasing companies).

In Chicago, meanwhile, where trailer interchange is highly rubber-oriented, an experiment "demonstrated that rail, as opposed to highway, interchange of TOFC traffic could produce the same service quality if performed in coordination with train schedules," and that it could produce that service quality at less cost. The decision as to rail or highway interchange was identified as volume sensitive (though there are some who would argue that it's just as much, or more service sensitive). In any event, a direct interchange experiment that would eliminate "rubbering" of trailers was being considered by several carriers this year.

The seniority district problem is even more complex, as might be expected. But management and labor joined in a request for a study on a Chicago road, a study that would develop data on manpower supply and demand in order to assist the parties in considering seniority district consolidation. What the study found was that "as a result of the sharp decline in railroad employment over time and the existence of multiple seniority districts, there coexisted, sometimes on one railroad, some locations where high-seniority employees were working only part time and other locations where new employees were being hired and trained. This condition cost employers in terms of fringe benefits and unemployment compensation and employees in terms of reduced opportunities for work."

The study went further, to find that "manpower planning to identify demand and supply, when combined with the merger of seniority rosters, could be of significant benefit to both labor and management. Data were developed on employment, earnings, and employee utilization. The study concluded that (1) due to extensive part-time employment, the carriers' operating-craft seniority rosters were too large by 18%; (2) with seniority district consolidation, savings in fringe benefits and unemployment payments would be large; and (3) due to labor force age and attrition, protection could be provided to existing employees at minimal expense to the company.

Then there was the issue of specific commodities:

"In some cases, the movement of particular commodities via rail raises unique issues and problems for terminal operations. The Houston terminal project identified two such cases and worked on developing potential solutions. One case involved the movement of aggregates, where existing operations resulted in long turnaround times for the cars in this service. A unit train operation was developed in conjunction with the involved railroad and aggregate shippers. The initial attempt at experimentation ran for one day and did not address the needs of the parties satisfactorily. The Houston team has been working with shippers and railroads in an attempt to design a different approach. (This, it might be noted, was perhaps the one experiment in which little or nothing of value resulted from a Task Force approach.)

"Another specific problem brought to the Houston project's attention was the failure to maintain the integrity of unit grain trains. Using the TPMS, a study of a specific grain train movement, unit trains destined for an export elevator at a point in Houston, was conducted. The study, made in conjunction with the Texas Transportation Institute, documented that unit trains were being received intact but cars were being returned in bunches. The reasons identified were the lack of sufficient holding tracks at receiver locations to build trains, the lack of sufficient hold tracks on terminal roads to reassemble trains, and the lack of rewards or penalties related to maintaining integrity. The study identified several areas for possible action by carriers and shippers, including facility construction, agreements with terminal roads to rebuild trains, tariff restructuring to provide incentives for integrity, and increased pooling of privately owned cars."

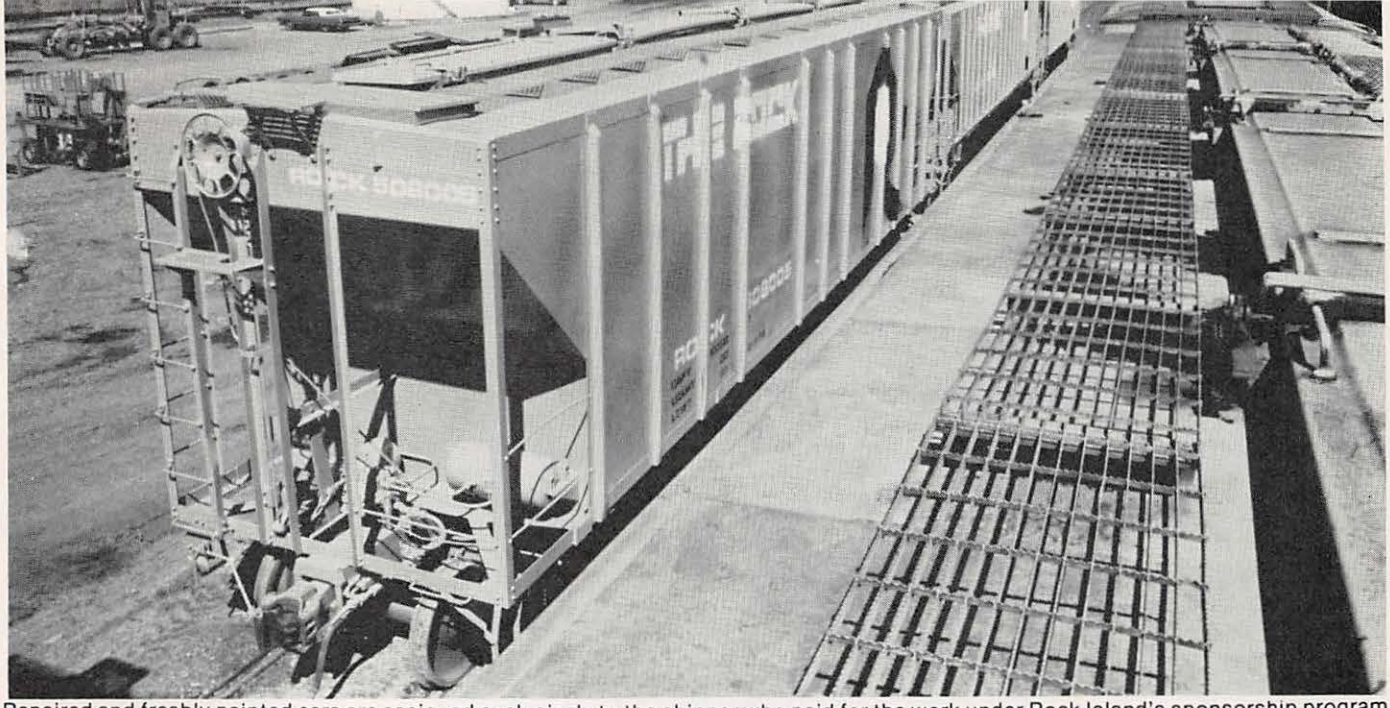
● **Cooperation: It works.** These Task Force approaches are cooperative efforts, staffed by labor and management representatives and designed to be funded by the Federal Railroad Administration, the AAR, the individual carriers and labor.

Through it all, since the first experiment began in 1973, FRA has done its part. With only a few exceptions, managements have done their part. Labor, perhaps, has done its part in better fashion at the local, project team level (especially since 1977), although it is hoped that labor participation will be resumed at the Task Force level.

The importance of broad participation can hardly be overstressed—just as the complexities of communication can hardly be exaggerated, as one example illustrates—an example involving a new approach to management-labor communications in connection with interchange.

This particular experiment involved Indiana Harbor Belt and Conrail, the change of an interchange point and the elimination of an intermediate handling of cars: "Aided by local labor consultants, the project team worked to involve labor in the process through a series of labor-management meetings to discuss possibilities and the experiment's intent and design. The process of communications was complicated by interest and involvement of nine union general chairmen and 17 local chairmen, plus eight management representatives on the two roads. In order to involve labor and management in the experimental process, the Chicago team developed the approach of establishing a joint monitoring committee, with labor and management representatives, which reviewed the experiment periodically and acted to lessen apprehension and insure acceptance. The committee is now assisting in developing a permanent change, since the experiment was successful. The use of joint monitoring committees has proven a valuable approach, and it is a part of many of the current project team experiments."

Overall, as labor's involvement picked up again toward the end of last year, communications efforts were increased on local bases (while ways and means of restoring national-level participation are being explored). Given a resumption of labor involvement, Task Force activity should become more effective. As the Task Force points out, during the period of labor's withdrawal, project teams concentrated on management practices and intercarrier relationships and were able to produce results—but at the same time the teams were constrained from dealing effectively with labor-related issues. ■



Repaired and freshly painted cars are assigned exclusively to the shipper who paid for the work under Rock Island's sponsorship program.

A shipper who pays for freight car repairs—and likes it!

By FRANK MALONE
Associate Editor

Many shippers seem to think that being "captive" to one railroad is problem enough these days. But what if that railroad is bankrupt and can't afford to repair cars as quickly as other railroads? And what if that shipper can't afford to improve car supply by leasing or buying some equipment of its own?

One shipper in those straits is Bellrose Silica, an Ottawa, Ill., sand company, served only by the Rock Island. But so far this year (except for a strike-caused disruption in late August), Bellrose has been loading more cars than ever before, and the company's vice president for traffic, Richard C. Sheffel, expects to see continuing improvement in car supply.

That's because, after dealing with rail transport for more than 20 years, Sheffel is more involved with a railroad than he ever thought possible—through the Rock Island's sponsorship program for repair of freight cars, in this case covered hoppers.

That means Bellrose Silica, in effect, pays for the repairs. In return, the cars are assigned to that shipper's service. And a recent refinement has deepened Bellrose's involvement in what is now a "perpetual" arrangement.

"In my wildest imagination 20 years ago, I never thought we'd be doing anything like this," Sheffel says. "It would have seemed like too much involvement with the railroad industry. But now, we have no plans at all to abandon the program."

● **"Clear benefit ... but."** Sheffel wouldn't think of getting out now because he really *couldn't*. He was virtually forced into it, and he's more or less being forced to stay. But he doesn't seem too unhappy about it. "There's going to be a continuing need for this kind of cooperation between railroads and shippers," he says. "There's also going to be clear benefit for the shippers who get involved."

Benefit is something, however, that Sheffel would like to see more of. Though car supply has improved, it still isn't adequate. "It's considerably better than what it was, but we can't get new business without cars and we could get new business today if we had more," he says.

For competitive reasons, Bellrose (a privately owned company with three partners, including Sheffel) is reluctant to reveal monthly carloading figures, but both the company and the Rock Island claim that loadings are on a steady rise. One competitive reason is a neighboring sand company, Ottawa Silica, also part of the sponsorship program. But between the two companies, there is, besides competition, a major difference: Ottawa Silica is also served by Burlington Northern.

Though Bellrose Silica is based in Ottawa, a north-central Illinois community of about 19,000 on both BN and RI, its plant is located about 10 miles west, at Utica on RI. Though the distance might seem short, it is long enough to keep Bellrose from loading anywhere except at Utica.

"We have many different varieties of sand, and it would mean building entirely new loading facilities and then absorbing the cost of trucking," Sheffel says. "Between the two costs, we just could not make it."

Trucking costs are the reason also for the fact that 85%-90% of Bellrose sand moves on railroads to markets in eastern, western, and northern states and eastern Canada. Because of last winter's problems, however, the rail/highway ratio was about 50/50 for a while, and currently there is some long-haul trucking to markets in the East. That, Sheffel concedes, is expediency, not good economics. Nonetheless, trucks have made inroads: three and a half years ago, 96.8% of Bellrose's production moved out by rail.

Regardless of the rail percentage, however, all Bellrose products are moving in railroad-owned cars. That won't change, says Sheffel: "It's simply not economical for us to lease cars. Turnaround time is too poor to justify it." He says Bellrose is currently getting one-and-a-half trips per month per car. "But," he adds, "that's not entirely the Rock Island's fault."

● **Reversing the erosion.** One man working to do something about that is Don Lippert, recently named Rock Island assistant to president-special transportation programs. He wants to reduce car time on his railroad from a week to three days for shippers like Bellrose Silica. That company's car sponsorship has been

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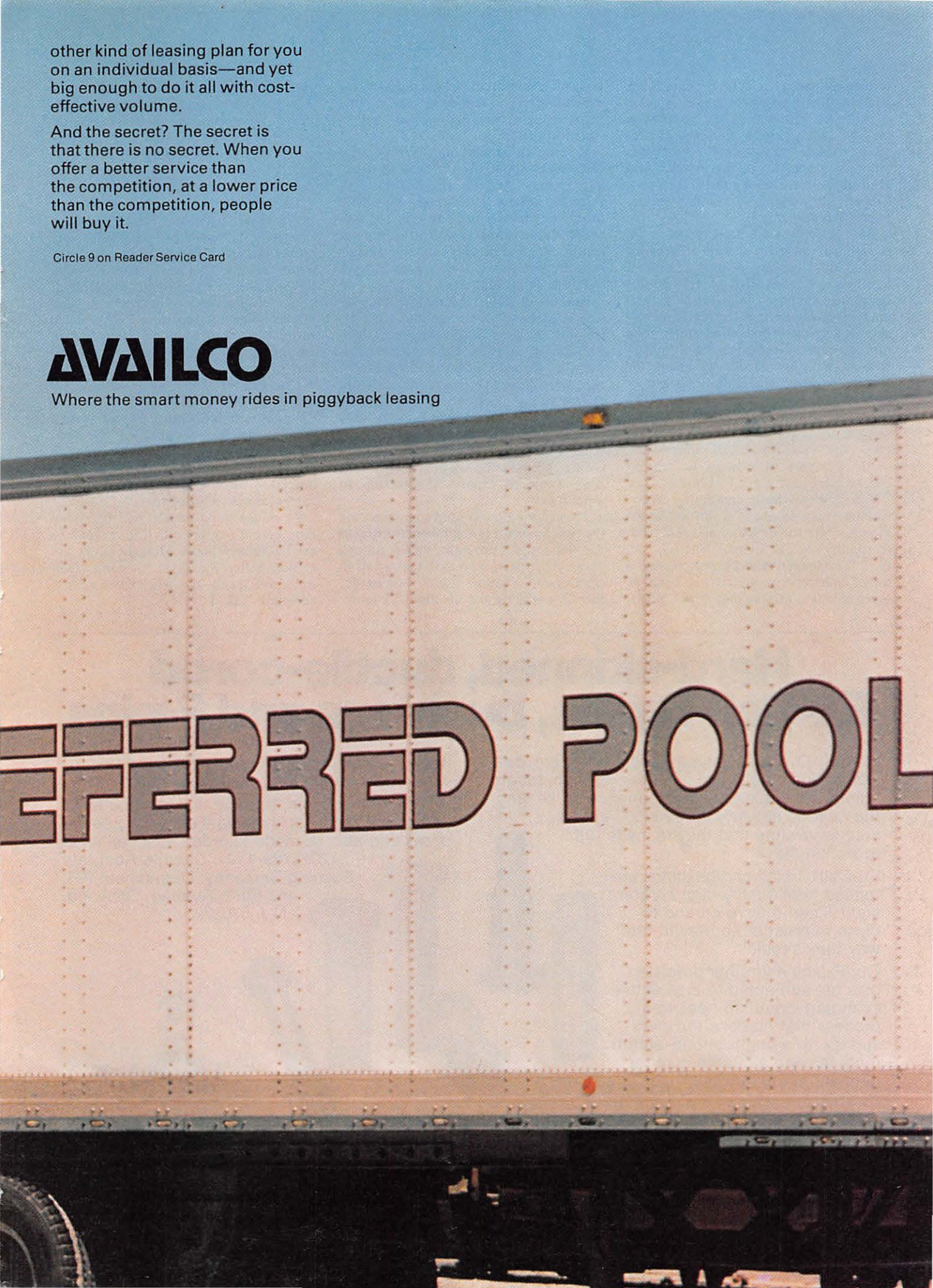

refined as part of a new, broader Rock Island effort to reverse traffic erosion such as seen with sand. The new effort, a profit-center approach, is aimed at providing total transportation packages tailored to specific shipper needs. And sand shippers are among the first targets, Lippert says, along with other participants in sponsorship.

For Bellerose Silica, Lippert's approach has included design of doubled loading track capacity at the Utica plant, a project to be completed this fall. But the big change has been a switch to a "perpetual" revolving account for car sponsorship. It keeps Bellrose's funds going back into car repairs instead of back to Bellrose in monthly checks as under the former payback plan. Now the money goes into an escrow account from which funds are drawn quarterly for sponsorship car repairs at the railroad's El Reno, Okla., and Little Rock, Ark., shops.

"It was sort of silly to be sending checks back and forth," Lippert says. "And now we have continuity. We're running cars through at an estimated monthly rate for Bellrose, and that leads to fluidity for our shops." Sheffel, too, likes the change: "Before, we just had a lot of unnecessary paperwork." But he especially likes dealing only with Lippert, now his main Rock Island contact for everything from service to car supply. Formerly, he dealt with about half a dozen RI officers.

It seems to be working: "We have no complaints about the physical service," Sheffel says. And for the Rock Island, there has been a better return on traffic historically a loser or near-loser for railroads. Part of Lippert's effort is rate improvement, and he says sand movements now are profitable. Rate increases have had Sheffel's support:

Another Rock Island man in the picture is Richard M. Lombardo, administrator of the sponsorship program, which was started in 1976. He has also taken over the railroad's industrial development program, after 12 years in activities related to car distribution. He says the sponsorship program has brought in—interest free—about $13.5 million for repair of about 2,350 cars, mostly covered hoppers and DF boxcars (the railroad wants to expand sponsorship to other types).

Though the Illinois sand companies are the first among a few shippers shifting to the "perpetual" program, they're among about 70 shippers who have taken part in sponsorship. And, says Lombardo, there's a waiting list of about 85 more, just for jumbo covered hopper cars. About 95% of those shippers are "repeats" (shippers sign up for a specified period of time; when they leave the program, they get their money back, or the balance remaining, and lose the exclusive use of the "sponsored" cars).

Lombardo sees not only a continuing but a growing demand for sponsorship, especially by small, privately held companies that can't justify outlays for their own cars. As for the railroad: "You're looking at a resource that is available, if your 'costing-out' convinces you that you're better off repairing a 20-year-old car and collecting lower per diem than investing $45,000 in a new car just to collect high per diem."

One shipper who's glad the railroad opted as it did is, of course, Dick Sheffel. "We got into this because we just weren't getting adequate equipment," he says. "There was no alternative. We want to grow, too, and we don't want to be limited by forces that we might be able to control at least a little better."

As things stand now, it will be a long time before Sheffel calls the railroad to get his money back. Though things are getting better, he says: "I don't think we'll ever see the day when car supply is adequate." ■

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UP: Profits from recycling damaged freight cars

If Union Pacific's arithmetic is right, a lot of railroads may be passing up a pretty decent return-on-investment opportunity—in, of all things, the handling of heavily damaged and condemned freight cars.

Even more important, however, by making a $1.6-million investment at its Pocatello, Idaho, shop facility, UP has made a giant stride in improving the safety of car-dismantling operations.

UP has built, on 36 acres at Pocatello, a car storage and dismantling facility with five major areas:

—An on-the-ground storage park with room for 950 cars, with 850 spaces reserved for cars awaiting repair and the remaining 100 spaces assigned to condemned cars.

—A 10-bay car-dismantling area, each bay equipped with a tool storage shed and piped-in water, oxygen, and acetylene.

—An area where trucks will be dismantled.

—An expanded stores department area for processing recycled car and truck components.

—A new foreman's office building.

● **Around the clock.** UP will operate the facility 24 hours a day, five days a week, with the largest part of a 55-man work force assigned to the day shift and with operations scheduled for both maximum productivity and maximum safety.

The key to the operation is the use of a giant Drott crane capable of straddling two cars sitting side by side and of hoisting one car over the top of another. When damaged cars arrive at Pocatello, the first step will be to lift them off their trucks (if, in fact, they arrive rolling) and to crane position them in storage area slots.

Each slot is numbered, and UP has installed a computer-controlled inventory system, with the computer keeping track of such information as car location, car type, condition, parts availability, repairs needed, and traffic department priority by car type.

When the shop needs a specific type of car, it is a simple matter to call up the type and location on the computer terminal and then request the crane operator to deliver the desired car to the shop area for repair.

For cars condemned to the cutting torch, UP has installed a system that amounts to a disassembly line.

When the day shift reports for work each morning, a condemned car will be waiting in each bay, positioned ready for dismantling in the safest possible manner, and it's the day shift's job to reduce the wrecks to piles of scrap metal and reusable parts. On the second shift, a magnetic crane loads the scrap into gondolas, and salvageable parts are moved into the stores department area. Finally, on the third shift, a crane operator will pick up more condemned cars from their storage slots and spot them in the dismantling bays; a shop crane will position them for teardown; and the disassembly-line cycle is completed.

● **Why it is better.** There are, UP believes, a lot of advantages to the way it's now handling damaged equipment:

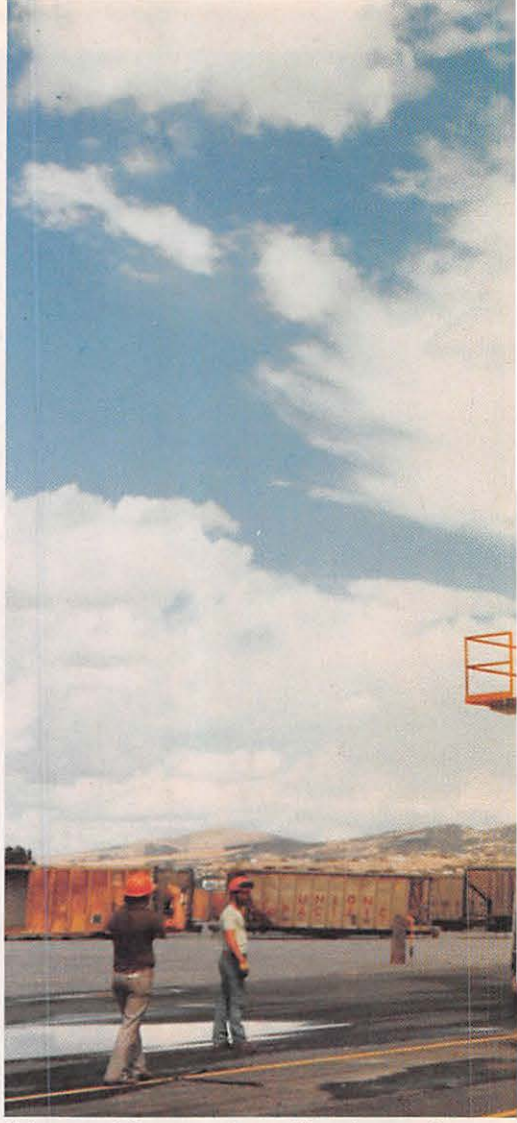
—Use of cranes (the big Drott and also a smaller unit) permits storage of cars on the ground (without trucks) and allows a crane operator to retrieve any car without having to move other cars. Switching operations are both costly and time-consuming, and, obviously, with the cranes in operation, there's no need for such switching.

—On-ground storage is allowing UP to release back to operations about 11 miles of yard and side tracks where damaged cars had previously been stored. This will both reduce congestion in the Pocatello yard and facilitate main-line operations.

—Trucks and running gear can be made available for car repair and new-car programs much more quickly, with such components removed from damaged cars as they arrive. As shop Superintendent Tom Jellison points out, such components have been in "critically short supply" because of carbuilder demand in meeting car buyer demand that has pushed the backlog near record levels.

—The safety factor is much improved in several ways. For one thing, cranes are not operating in the dismantling area while day-shift employees are torching condemned cars. For another, each dismantling bay is enclosed by a heavy guard rail, with "safe" walkways between bays. For a third, all combustible materials are removed from condemned cars before they are spotted in the bays, to prevent fires.

Then there's that matter of return on investment. UP spent $1.6 million on the facility. It's expecting savings of $4 million in the first year of the facility's operation from recycling and reuse of components alone, without even figuring in the operating savings the plant will produce. ■

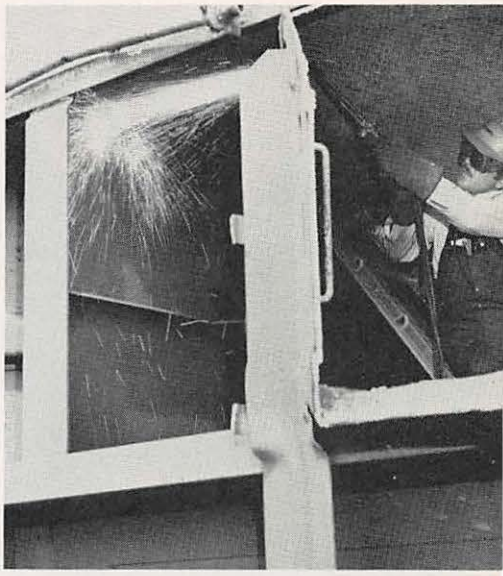


Using straddle cranes to position damaged cars

The car-dismantling area at the UP Pocatello

for storage or dismantling may become more common if UP's new approach catches on.

Removal of trucks when damaged cars arrive speeds reconditioning of salvageable parts.



A severely damaged covered hopper goes under the torch in a car dismantling bay.

shop is divided into 10 "security" bays, with designated "safe" paths clearly marked.

First shift positions cars; second dismantles them; third loads the scrap for shipment.

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Problem Pinpointing where a shipment is, where it has been, where it's going is very much a communications problem. But so is the efficient utilization of trailers and flatcars.

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Major railroads set up their own networks and computerized information and control systems. But now the need for greater transmission speeds and interaction with other systems poses new problems.

Solution Systems of Bell display terminals and high-speed printers now link hundreds of offices and ramps with central computers, as well as with shippers and other services.

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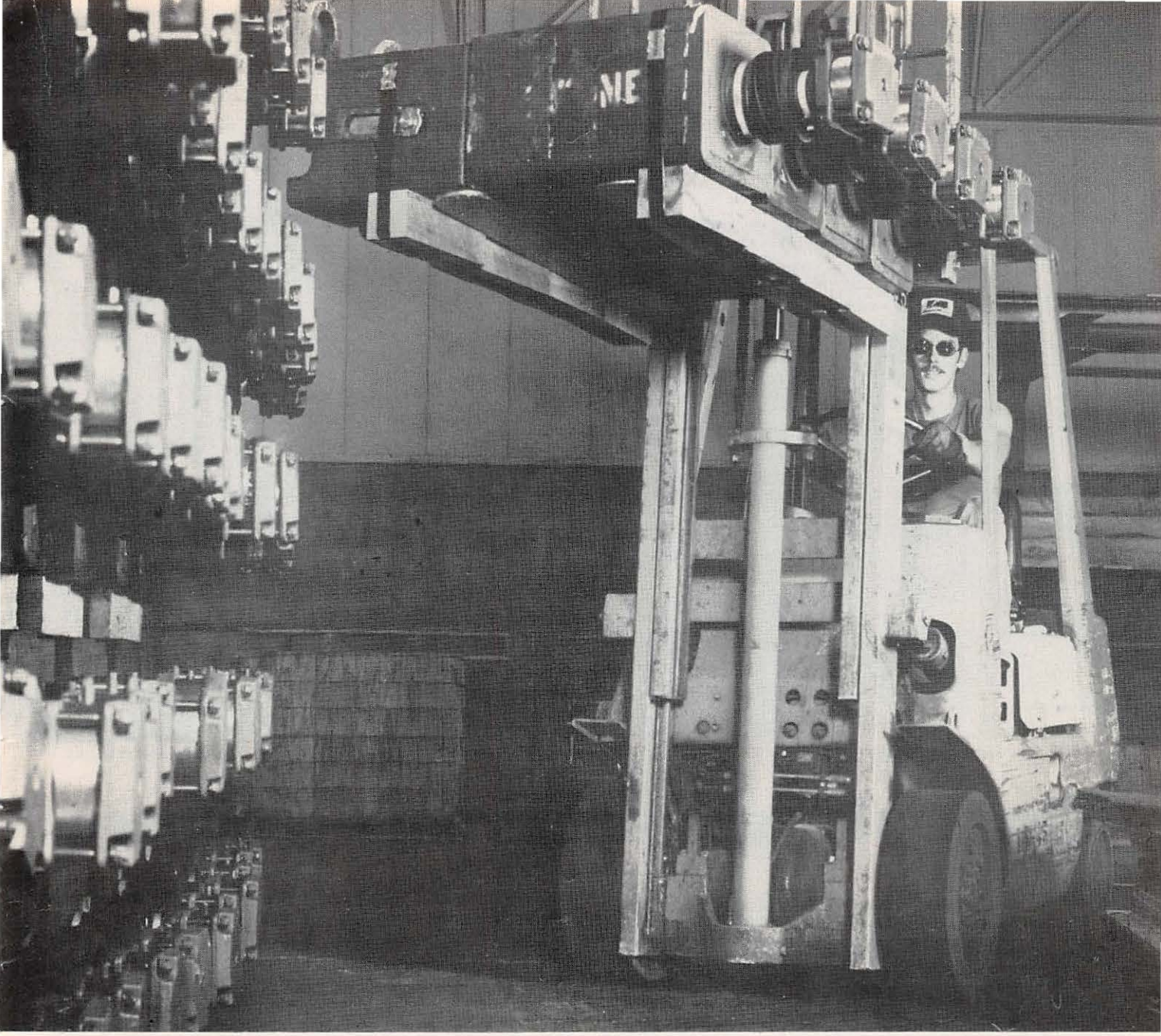

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New UP caboose, one of 100 from International Car, has bay windows on the sides instead of a cupola and rides on Swing Motion trucks.

The new look in—and from—cabooses

Some things stay the same—and some don't. For instance, the 100 new cabooses Union Pacific has been receiving from International Car Division of PACCAR are still painted yellow and trimmed in red. But on the top, on the sides and underneath, they're a whole lot different.

First, after more than a century of using cabooses with cupolas, UP has gone to a bay window design. And second, these 100 cabooses are the first to come off a production line equipped with Swing Motion trucks, a design developed by the National Castings Divison of Midland-Ross basically as a freight car truck.

● **"Many advantages."** UP will be using the new cabooses in a systemwide pool service, and they're already showing up off line on run-through operations. UP will be evaluating them in comparison with the cupola types, but Chief Mechanical Officer Frank D. Acord already sees "many advantages in this new design" (which also includes longer end decks, partially shielded).

One obvious advantage, of course, has to do with the ability of crew members to observe the train ahead of them. With increasing numbers of high cars, high-cube boxcars and enclosed trilevel autoracks among them, in the fleet, train observation from the cupola has become somewhat of a problem. But there's also a safety factor to consider, and the bay window design does eliminate the climb into the cupola and the descent from it, movements that have been known to coincide with slack-action jolts.

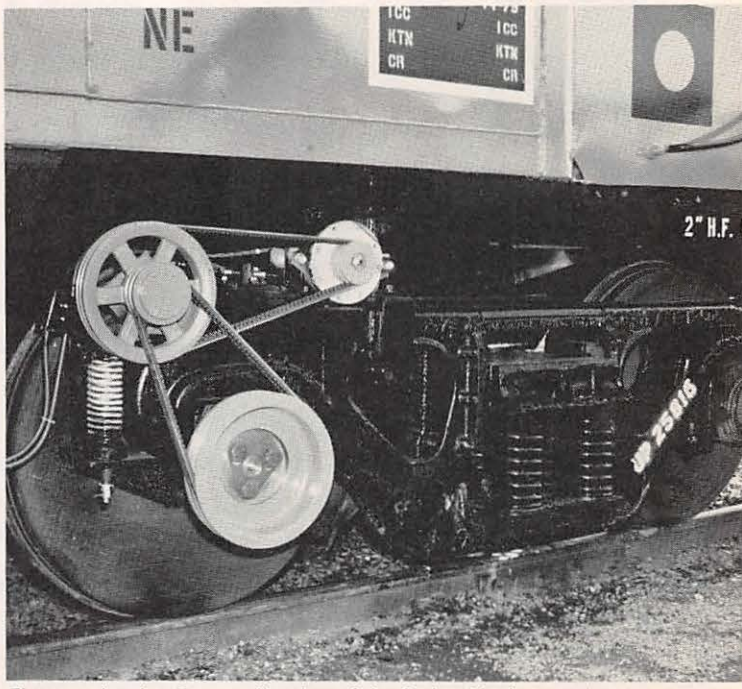
As for the trucks, UP has traditionaly been known as a railroad with good-riding cabooses. But as the type it had been using became harder to obtain, UP began searching around, and for this International Car caboose order it settled on the Swing Motion truck (which is now also being evaluated on two cabooses by Southern Pacific).

National Castings first put the Swing Motion into service in 1970, but—in common with other manufacturers of so-called "premium" trucks—it found the industry slow to react. National can cite service inspections showing that the trucks "have proven their ability to substantially reduce truck and wheel wear in high-speed service," but as of earlier this year the Swing Motion was rolling under only about 2,000 freight cars in the U.S., Canada, and Australia.

● **Starting with B&O.** Back in 1975, however, it made a trial application of the trucks on a Chessie System (Baltimore & Ohio) caboose, and the results turned up positive. An inspection in late-1977 showed truck conditions excellent with only minimal wear, and wheels showed little flange wear (although tread wear indicated that the actual service miles were substantially more than the 82,000 miles then estimated). National Castings' conclusion was that maintenance of truck components would not be required until the trucks had about 10 years' service.

Still later in '77, National and UP conducted tests, as National put it, "to determine if the Swing Motion ride characteristics were good enough to permit using these trucks in place of the substantially more expensive passenger-type GSI trucks which they normally use."

Trucks used in that test already had 400,000 miles on them (under a 70-ton freight car), but both they and the GSI trucks used for comparative purposes were in good condition. Swing Motion units were equipped with special springs for caboose service (to compensate for the lighter weight of a way car), and they underwent tests with and without use of an elastomeric sound-deadening material under the springs. Results, National found, were good: Both recorded test



First production line application of the Swing Motion truck to cabooses, shown with Dayco generating unit attached.

A home away from home, the caboose is outfitted safely, with a seat belt and shoulder harness on each bay window observation seat (top photo) and a comfortable conductor's office (bottom).

data and caboose-ride impressions indicated that the Swing Motion "provided a good ride which was firmer than the GSI trucks but better controlled for roll and sway motions."

Follow-up tests were held in April of last year; they too went well, and the result was that UP is getting its 100 cabooses from International Car with Swing Motion trucks carrying the load.

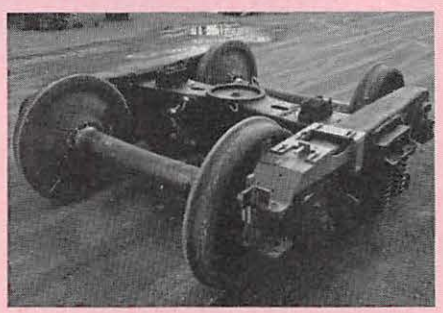
● **More—and less.** As for crew reaction, results are still a little bit mixed, but they do seem to bear out the test results, at least according to one report: The ride is indeed firmer, but with less roll and sway.

Finally, you could call it a caboose or a way car or a cabin car, but don't give it one of the other names given to the rolling office at the end of most trains: Don't call it a "crummy"—not at $6 million per hundred cabooses, not with the performance and the interior accommodations UP has bought. ■

The Swing Motion truck: What it is and what it does

If freight car rolling, pitching, swaying, or yawing or truck-hunting is a problem, and if a railroad wants to avoid excessive component wear while providing cars with a controlled and improved vertical and lateral ride, then National Castings believes it has an answer in the Swing Motion truck.

Among other things, the design incorporates a nonlinear (two-stage) vertical and lateral suspension system. As National puts it, because of the low lateral resistance of the truck, lateral forces transmitted to the carbody are small, which produces a good ride despite track-caused disturbances that are cushioned before any solid contact is made: "Since lateral forces are low and solid contact is



practically eliminated, very little wear occurs on wheel flanges, truck, and car components. Second, and even more important, the low-resistance characterisics permit the Swing Motion truck to run at speeds in excess of the critical speed which causes hunting."

Among the features National Castings cites as contributors to truck performance:

—Increased lateral motion, plus or minus 1¼ inch, with swing hanger type of suspension.

—Incorporation of control features that increase stability against car roll.

—Elimination of bolster gibs so that lateral forces are transmitted through the transom to the sideframe.

—Use of two-stage long-travel load springs to give a "soft response" to vertical forces under empty or light-loaded cars and a stiffer response under fully loaded cars.

The GATX TankTrain® system:

If you ship bulk liquids, here's something you should know about: the TankTrain system, from GATX.

The concept behind it is extremely simple: interconnect a string of tank cars with flexible hoses, and then fill and empty the entire string from just one end connection.

The operation is equally simple.

And the results are simply phenomenal. Loading and unloading times, and manpower requirements, are reduced dramatically, resulting in significant reductions in shipping costs. Shorter turnaround time means improved utilization of equipment, for both shippers and railroads.

And with just one loading connection, the TankTrain system is safer than conventional cars, both for operating personnel and from an environmental point of view.

The TankTrain system is effective in a wide range of situations. It can be used with as few as three cars, or in unit train numbers. And it can handle virtually any bulk liquid commodity, from liquids as easy to handle as methanol, to such hard-to-handle commodities as superphosphoric acid.

Photographed at: Peoria Barge Terminal, Inc.

"It's cut our car costs by 50%. That's right: 50%."

Dr. Charles Nevaril V.P., Supply and Distribution
Terra Chemicals International, Inc.

Terra Chemicals International, Inc. is a major manufacturer and marketer of agricultural chemicals, with retail distribution throughout the midwestern, southern and southwestern states, and wholesale distribution nationwide.

And Terra is now using the TankTrain system, to ship urea-ammonium nitrate fertilizer solution from its Bison Nitrogen Products Plant in Woodward, Okla. to terminals in the Midwest.

Here's what Chuck Nevaril, V.P., Supply and Distribution, has to say about the TankTrain system: "We move a lot of urea-ammonium nitrate solution to the Midwest... about 10 million gallons a year. And we're shipping it with the TankTrain system: a 15-car string that carries 260,000 gallons.

There's been a real increase in convenience. And the one-connection feature has certainly reduced our personnel's exposure to bad weather.

But the bottom line, of course, is cost. And that's where the Tank Train system really comes through.

On the average, we estimate that we're actually cutting our tank car and handling expense by about 50%, compared to the cost of shipping with conventional cars. And that 50% figure includes the cost of the minor modifications to existing facilities that were required for the TankTrain system.

No matter how you look at it–from the standpoint of cost, or plain ease of handling–the TankTrain system is a tremendous improvement."

If you ship any kind of bulk liquid, TankTrain can probably help you cut shipping costs, too. Perhaps not by 50%, but surely by a significant margin.

For further information, or for a full presentation, call GATX at (312) 621-6322. We'll be glad to answer any questions you might have about the TankTrain system. The safest and most efficient tank car system in the world today.

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QUARTERLY INDEXES

Railroad charge-out prices and wage rates (Average 1967 = 100)

(Charge-out indexes reflect the original purchase price of fuel, material, and supplies charged to railroad operating expense accounts on the first day of the quarter. The indexes are developed from quarterly spot price indexes by providing appropriate lags between time of purchase and time charged to operating expense accounts. Wage rate indexes are based on average straight time hourly rates for the first month of the quarter; wage supplements indexes are based on the average per straight time hour paid for payroll taxes, health and welfare benefits, vacations, holidays, and other allowances.)

District and group	July 1976	Oct. 1976	Jan. 1977	Apr. 1977	July 1977	Oct. 1977	Jan. 1978*a*	Apr. 1978*a*	July 1978*a*	Oct. 1978*a*	Jan. 1979*p*	Apr. 1979*p*	July 1979*p*
UNITED STATES:													
Fuel	347.3	352.6	360.4	381.1	395.3	399.0	403.1	405.9	405.0	407.2	419.7	469.6	603.2
Other materials & supplies	202.7	207.6	209.6	213.8	216.8	221.3	224.4	227.0	230.2	233.4	239.1	245.7	250.4
All material incl. fuel	243.4	248.5	252.1	260.6	266.5	270.9	274.3	277.0	279.2	282.1	289.8	307.5	345.6
Wage rates	212.5	213.8	219.4	220.0	231.3	232.8	240.8	248.2	254.8	259.7	267.5	267.5	285.6
Material prices & wages (and fuel)	222.2	224.7	229.6	232.7	242.3	244.7	251.3	257.2	262.4	266.7	274.5	280.0	304.4
Wages & supplements	232.5	233.5	241.6	243.1	253.6	254.7	267.2	272.9	278.1	281.9	294.1	294.1	311.4
Material prices, wages & supplements (excl. fuel)	226.7	228.4	235.4	237.4	246.4	248.2	258.9	263.9	268.8	272.4	283.4	284.7	299.5
Material prices, wages & supplements (incl. fuel)	235.5	237.6	244.5	247.9	257.1	259.2	269.2	274.0	278.4	282.0	292.9	297.8	320.8
EASTERN DISTRICT:													
Fuel	346.3	351.4	361.4	386.7	405.0	407.6	411.1	416.3	413.4	413.1	422.1	476.3	580.1
Other materials & supplies	197.8	202.3	204.4	208.5	210.2	213.4	216.2	217.2	221.5	226.0	230.2	239.6	243.0
All material incl. fuel	238.9	243.7	247.7	257.4	263.5	266.4	269.6	271.6	274.1	277.4	282.9	304.0	333.1
Wage rates	212.7	213.7	220.1	220.6	229.9	232.8	242.6	249.5	257.7	262.6	270.4	270.4	288.5
Material prices & wages (and fuel)	219.7	221.7	227.5	230.4	238.9	241.8	249.8	255.4	262.1	266.6	273.7	279.4	300.4
Wages & supplements	232.4	233.2	242.4	243.9	252.8	255.1	270.3	275.8	282.1	285.9	298.2	298.2	315.7
Material prices, wages & supplements (excl. fuel)	226.8	228.2	236.2	238.2	246.0	248.3	261.5	266.3	272.3	276.2	287.2	288.7	303.9
Material prices, wages & supplements (incl. fuel)	233.9	235.6	243.6	247.0	255.3	257.7	270.1	274.8	280.2	283.9	294.6	299.6	319.8
SOUTHERN DISTRICT:													
Fuel	319.0	324.1	332.0	354.3	369.3	372.2	375.6	375.3	373.0	374.7	389.1	428.4	509.3
Other materials & supplies	198.7	202.4	206.2	209.9	213.3	217.9	220.0	223.3	226.1	229.5	234.7	240.4	246.3
All material incl. fuel	230.8	235.0	239.7	248.6	255.0	259.2	261.6	263.9	265.4	268.4	276.0	290.7	316.8
Wage rates	214.0	213.9	218.9	219.4	233.6	233.2	239.6	248.9	255.5	260.4	268.3	268.3	286.5
Material prices & wages (and fuel)	219.7	221.1	226.0	229.4	240.9	242.1	247.1	254.0	258.9	263.1	270.9	275.9	296.8
Wages & supplements	235.1	235.0	241.9	243.5	256.3	255.9	265.9	273.2	278.5	282.4	294.3	294.3	311.8
Material prices, wages & supplements (excl. fuel)	227.2	228.0	234.2	236.2	247.0	247.7	256.0	262.4	267.2	271.0	281.4	282.7	297.7
Material prices, wages & supplements (incl. fuel)	233.8	235.0	241.2	245.0	255.9	256.9	264.6	270.4	274.6	278.2	288.8	293.2	313.3
WESTERN DISTRICT:													
Fuel	358.1	363.6	370.0	387.7	399.6	404.1	409.2	411.5	412.1	416.0	429.1	480.8	650.1
Other materials & supplies	206.9	212.6	213.9	218.5	221.9	227.2	230.8	233.7	236.5	239.2	244.7	251.6	256.3
All material incl. fuel	251.8	257.5	260.3	268.3	274.0	279.3	283.4	286.2	288.5	291.7	299.3	317.9	364.7
Wage rates	212.1	214.0	219.4	220.0	231.9	232.8	240.3	247.1	253.0	257.9	265.8	265.8	283.7
Material prices & wages (and fuel)	225.5	228.7	233.2	236.3	246.1	248.5	254.8	260.3	265.0	269.3	277.1	283.4	311.0
Wages & supplements	232.0	233.5	243.7	243.7	253.7	254.4	265.9	271.2	257.8	279.6	291.7	291.7	309.0
Material prices, wages & supplements (excl. fuel)	226.6	229.0	235.4	237.6	246.9	248.6	258.4	263.2	267.4	271.0	281.6	283.1	297.7
Material prices, wages & supplements (incl. fuel)	237.9	240.6	246.9	250.4	259.7	261.8	271.1	275.7	279.6	283.2	294.0	299.5	325.5

p—Preliminary *a*—Wage rates in 1978 reflect the effects of retroactive pay increases applicable to time worked in 1978 but paid in 1979.

Spot prices of railroad fuel, material, and supplies (Average 1967 = 100)

(Spot price indexes reflect the price on the first day of the respective month of 65 major items of railroad purchases reported by 10 major railroads representing about two-thirds of total purchases by all Class I railroads.)

District and group	July 1976	Oct. 1976	Jan. 1977	Apr. 1977	July 1977	Oct. 1977	Jan. 1978	Apr. 1978	July 1978	Oct. 1978	Jan. 1979	Apr. 1979	July 1979
UNITED STATES:													
Fuel (diesel oil)	348.5	354.8	363.3	389.9	398.1	399.7	405.0	406.2	404.4	408.8	425.4	491.6	659.1
Forest products	215.3	217.2	217.0	225.2	229.4	234.0	240.0	240.9	250.8	258.6	264.5	272.3	286.2
Iron & steel prod.	219.0	219.8	223.7	224.1	230.1	233.1	235.4	242.5	245.8	252.4	263.0	268.7	277.5
Miscellaneous prod.	199.6	202.5	208.2	212.1	215.7	218.2	220.1	221.3	222.5	227.0	231.1	234.3	243.7
Total, excl. fuel	207.6	209.6	213.8	216.8	221.3	224.4	227.0	230.2	233.4	239.1	245.7	250.4	260.2
Total, incl. fuel	247.4	250.5	255.9	265.1	270.7	273.4	276.5	279.5	281.5	286.8	296.3	316.9	367.3
EASTERN DISTRICT:													
Fuel (diesel oil)	346.6	353.6	365.2	397.3	408.9	407.0	413.4	417.9	411.1	414.0	426.2	501.4	619.6
Forest products	204.4	206.6	208.4	212.4	217.9	220.9	224.8	225.4	234.2	237.5	251.0	254.6	267.0
Iron & steel prod.	207.2	207.7	213.5	213.3	218.8	221.6	221.6	229.9	234.1	240.1	251.6	257.1	266.0
Miscellaneous prod.	202.7	206.4	209.6	212.8	213.1	215.6	216.8	218.4	222.0	224.4	231.0	232.4	242.8
Total, excl. fuel	202.3	204.4	208.5	210.2	213.4	216.2	217.2	221.5	226.0	230.2	239.6	243.0	252.9
Total, incl. fuel	242.5	245.9	251.8	261.5	266.9	268.4	270.9	275.2	277.0	280.8	291.2	313.0	350.9
SOUTHERN DISTRICT:													
Fuel (diesel oil)	318.7	326.6	334.6	364.2	371.9	372.2	377.3	374.4	372.4	375.8	395.9	444.8	541.6
Forest products	213.9	223.5	225.7	227.4	232.2	230.4	240.2	242.0	255.4	258.7	266.5	276.9	288.4
Iron & steel prod.	220.0	221.6	225.4	226.2	232.6	236.2	238.0	245.5	247.3	254.3	263.1	269.3	277.4
Miscellaneous prod.	190.9	194.5	199.2	205.9	209.0	211.1	213.7	212.1	213.5	217.8	219.9	224.0	230.2
Total, excl. fuel	202.4	206.2	209.9	213.3	217.9	220.0	223.3	226.1	229.5	234.7	240.4	246.3	254.0
Total, incl. fuel	233.5	238.4	243.3	253.7	259.3	260.7	264.6	265.8	267.8	272.4	282.0	299.4	331.3
WESTERN DISTRICT:													
Fuel (diesel oil)	360.1	365.2	372.3	395.4	401.8	405.4	410.5	412.1	412.1	417.9	434.9	503.6	723.0
Forest products	227.4	226.0	223.8	237.1	240.7	250.2	254.8	255.8	265.2	259.9	279.0	288.0	304.2
Iron & steel prod.	217.6	218.2	221.7	221.7	227.6	230.6	233.7	238.9	242.8	250.1	260.4	265.3	274.9
Miscellaneous prod.	203.3	205.7	212.1	215.9	220.9	223.8	226.2	227.9	228.4	234.9	236.9	240.8	250.5
Total, excl. fuel	212.6	213.9	218.5	221.9	227.2	230.8	233.7	236.5	239.2	244.7	251.6	256.3	266.8
Total, incl. fuel	256.6	259.1	264.4	273.1	278.6	282.5	286.0	288.7	290.5	296.5	305.9	327.3	391.5

Note: Based on prices as of first day of months shown.

Source: Economics and Finance Dept., AAR.

People in the News

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—Kelvin Grant Ozburn, Jr., appointed assistant vice president-traffic, Southern Region, at 151 Ellis Street, N.E., Atlanta, Ga., Suite 308. Mr. Ozburn was affiliated with the **Southern Freight Association** at Atlanta for 15 years.

BURLINGTON NORTHERN.—Dean J. Wigstrom, senior assistant vice president of the controller's division, Finance Department, St. Paul, retired Aug. 1 after 42 years' service.

In the Internal Audit Department, St. Paul, **Thomas W. Dimich, Richard L. Ebel, Shirley J. Petersen, Paul S. Planton** and **Curtis H. Threat** named associate internal auditors.

The following named regional managers of sales and service, Marketing Department: **Ernest J. Darnell,** Fort Worth, Tex.; **Paul D. Haertel,** Tacoma, Wash., and **Howard E. Houchard,** Los Angeles.

Jack A. Bichsel, director mechanical services, St. Paul appointed regional manager-mechanical, Chicago Region, Chicago, to succeed **Robert J. Seeley,** who becomes regional director-mechanical, Billings Region, Billings, Mont.

James T. Verstraete appointed assistant manager of public relations, Seattle Region, Portland, Ore., effective Sept. 15. He was formerly director, Downtown Council, **St. Paul Area Chamber of Commerce.**

CP RAIL.—Jack C. Matlock has been appointed manager of marketing for the United States, at Montreal. **K.W. Power,** assistant manager pricing, Atlantic Region, Montreal, named assistant manager pricing, Prairie Region, Winnipeg, Man.

Ken Porter, commodity manager, manufactured products, marketing and sales, appointed system manager, freight claims. Mr. Porter has been succeeded by **Jean Claude Daigle,** former project director for **Canadian Pacific Consulting Services** in West Africa.

CONRAIL.—Robert A. Rutledge, general manager, **Indiana Harbor Belt,** named to the newly created position of director-lake coal and ore transportation, Conrail, Cleveland

DETROIT, TOLEDO & IRONTON.—Richard W. Lawrence, manager of claims and special services, appointed director-freight claims and security, Dearborn, Mich.

ELGIN, JOLIET & EASTERN.—Jay W. Moody, superintendent, Gary and Joliet division, appointed director of labor relations, Joliet, Ill.

FLORIDA EAST COAST.—L.D.Saggus, district sales manager, appointed regional manager-sales and service, with headquarters as before at Atlanta, Ga. **A.L. Johnson, Jr.,** appointed assistant regional manager-sales and service, Hialeah, Fla.

FRISCO.—R.G. Baumgartner named assistant superintendent, St. Louis Terminal division. The following named trainmasters: **E.R. Smith** and **G.W. Campbell,** St. Louis Terminal division; **C.E. Brooks,** Tulsa Terminal division; **D.F. Ladd,** St. Louis and Chaffee subdivisions, Chaffee, Mo.,; **J.W. Tolbert,** Tupelo and Columbus subdivisions, Amory, Miss.

FRUIT GROWERS EXPRESS CO.— Has relocated its Purchasing and Materials Departments at 3220 Duke Street, Alexandria, Va. 22314.

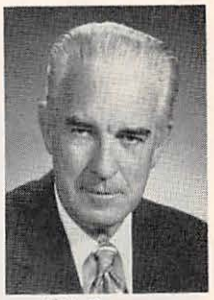
LONG ISLAND.—Joseph B. Flynn, former New York City Police Department deputy inspector, named chief of police of the LI's 138-officer force, succeeding **Peter P. Fabel,** who retired Aug. 31 after 31 years with the railroad police.

LOUISVILLE & NASHVILLE.—James C. Padgett appointed general superintendent-equipment, Louisville, succeeding **Carroll O. Wines,** who has retired after 43 years in the L&N Mechanical Department. **Carl R. Gambrell** appointed superintendent-equipment, Louisville. **Carol A. McNulty** named attorney, Law Department, Louisville.

MISSOURI-KANSAS-TEXAS.—O. Chris Putsche, assistant vice president, management information services, Denison, Tex., named general superintendent transportation.

Richard L. Teague, sales manager, Detroit, Mich., appointed division sales manager, Denison. **David Rose,** sales representative, Dallas, appointed assistant sales manager, Detroit, replacing **Al E. Massey,** promoted to sales manager there.

O. Chris Putsche
M-K-T



J.M. Beaupre
RAC

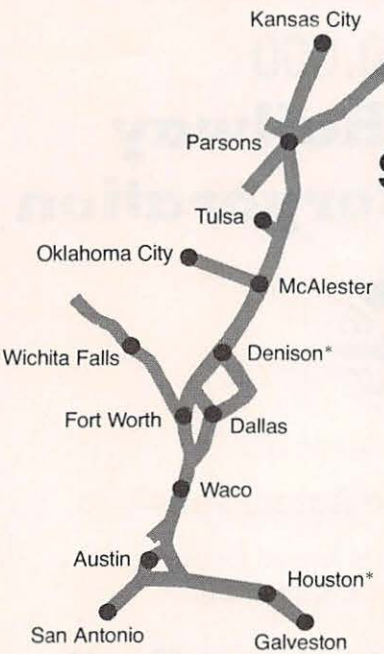
RAILWAY ASSOCIATION OF CANADA.—J.M. Beaupre, national sales manager-intermodal services, **Canadian National,** Montreal, appointed general manager, RAC, succeeding **R.E. Wilkes,** retired.

ST. LAWRENCE.—Hugh Grady named car shop manager and plant supervisor for the recently completed car shop located in Norfolk, N.Y.

TRAILER TRAIN.—E.T. Harley, who joined TT in May as chief mechanical officer, elected vice president-equipment, succeeding **W.R. Shannon,** retired.

U.S. RAILROAD RETIREMENT BOARD—Emil T. Banjavic appointed director, San Francisco Regional Office.

"BREAK OLD TIES;



START WITH NEW . . ."

The Katy has taken on a *new look* with the rehabilitation of over 60% of it's mainline corridor with the insertion of new ties, ballast, and portions of new welded rail.

KATY
M-K-T RAILROAD

HOUSTON-DENISON*
Starting from Houston the mainline has been reworked to a point just north of Denison.

Missouri-Kansas-Texas Railroad Co.
Sales & Service Department Headquarters
701 COMMERCE • DALLAS, TEXAS 75202
214-651-6712

Thomas P. O'Boyle
Trans Union

William J. Devers
Trans Union

Carl W. Peterson
Trans Union

Ronald Marsh
True Temper

Gerry A. Lieb
True Temper

Ray T. Johnson, Jr.
Woodings-Verona

Trans Union Corp. has named the following to newly created positions: **Thomas P. O'Boyle,** senior vice president-administration; **William J. Devers**, senior vice president, and **Carl W. Peterson**, senior vice president and controller. Mr O'Boyle was previously senior vice president, Mr. Devers, vice president, and Mr. Peterson, vice president and controller.

Ronald Marsh, general sales manager, **Railway Appliance Division, True Temper Corp.,** Cleveland, Ohio, has been appointed to the newly created position of vice president of sales. **Garry A. Lieb,** manufacturing manager, has been appointed to the newly created position of vice president of manufacturing. **Gayne M. Petranek,** manager of accounting, has been appointed controller of the division.

Ray T. Johnson, Jr., has been appointed general manager, Transportation Products Division, **Woodings-Verona Tool Works, Inc.,** Pittsburgh, Pa. Mr. Johnson has over 33 years experience in the railroad and forging industries with Pacific Forging, Portec., Inc., and Mid-West Forging.

Mark A. Bowsher has been named a design engineer, **Gustin-Bacon Division, Aeroquip Corp.,** Lawrence, Kan.

Fred Grafton has been named manager of the newly formed Commercial Division **Raychem Corp.,** which will specialize in bringing their products to a wide variety of markets, including the rail/mass transit marketplace.

Robert S. Toms has been appointed sales engineer, Research and Development Division, **Miner Enterprises, Inc.,** Chicago.

This announcement appears as a matter of record only.

August 1979

$30,000,000

National Railway Utilization Corporation

Conditional Sale Agreements

The undersigned has arranged for the private placement of this financing

Janney Montgomery Scott
INC.

Philadelphia New York

Circle 12 on Reader Service Card

Industrial Traffic

George Glaesser has been named to the new position of assistant manager, transportation services/rail, Industrial Chemical Group, **FMC Corp.,** Philadelphia. **Gordon Heisler** has been promoted to assistant manager, transportation services/truck. **George Fuchs** has been named supervisor of transportation rates. Messrs. Glaesser, Heisler and Fuchs were formerly transportation specialists. **Larry Mungiole,** formerly with **Rohm & Haas Co.,** has been appointed assistant manager, technical services, a new position.

Ted C. White has been promoted to director of transportation, grain and soy products, Traffic Division, **Farmland Industries, Inc.,** in Hutchinson, Kan. **Donald G. Rose** has been promoted to manager, grain and grain products transportation, Kansas City, Mo. **Gary H,. Robinson** has joined Farmland as supervisor, grain transportation, reporting to Mr. Rose.

Thomas J. Jeides has been named corporate manager of domestic transportation, **FMC Corp.,** Chicago.

Robert L. Henderson, manager of corporate traffic, **J I Case Co.,** Racine, Wis., has been elected president, **Midwest Advisory Board.**

Edward A. Robinson has been designated the national industry director of transportation for **Deloitte Haskins & Sells,** St. Paul, Minn. He has also been appointed accounting and auditing coordinator for the firms services to the railroad industry. Mr. Robinson has recently been in Washington, D.C., on consulting engagements for the **Federal Railroad Administration.**

Obituary

Champ Carry, 83, retired president and chairman, **Pullman, Inc.,** died recently in Lake Forest, Ill.

Ritchey Cring, 78, who retired in 1971 as vice president for public relations , **Missouri-Kansas-Texas,** died Aug. 13 in St. Louis, Mo.

Frank H. Nicholson, 92, who retired in 1955 as chief engineer, **Union Switch & Signal Division, WABCO,** died Aug. 26 at Pittsburgh Hospital. He held a number of patents in railway and train control.

We'll put your Bad Ordered Equipment on Track FAST!

Because you're losing money when your cars are just sitting—*anywhere.* On track. In your shop. Or ours.

The point is: with Unarco Transportation Equipment, your cars never sit. Quick turn-around is what we're geared up to deliver... and more!

Our Omaha plant is a totally integrated complex, fully equipped with fabricating and forming facilities to handle most anything from minor general repairs to wrecks and complete rebuilds. We're AAR approved and certified for FRA periodic inspections.

Our in-plant staff includes railroad-experienced engineers who can follow through on any request from simple modifications to extensive freight car redesign.

Our Equipco Brand Freight Car Equipment is recognized throughout the industry for reliability and performance. They include Equipco Sliding Side Doors, Bulkheads of all types, PDQ Systems, Hand Brakes, and Heavy-duty Side Fillers.

For quick turnaround, quality workmanship, and superior on-track performance, contact Unarco Transportation Equipment. FAST!

Repair... Rebuild... Modify

Unarco Transportation Equipment

Division of Unarco Industries, Inc.
332 S. Michigan Avenue, Chicago, Illinois 60604
Phone: 312/341-1234
Circle 14 on Reader Service Card

100 YEARS AGO IN

(September 18 and 25, 1879)

Daniel Drew, for many years one of the leading figures in Wall street, died on the 19th inst., at the house of his daughter at Carmel, N.Y., in his eighty-third year. His life has been a remarkable one. He commenced business a cattle drover. Afterwards he became conspicuous as a manager of steamboat lines. Later he invested largely in railroads, especially in the Erie road, until at one time he was recognized as the leading operator on Wall street. He was careful and persistent in business, and, as his length of life indicated, had regular habits of living. He was also distinguished by liberality to certain educational interests of the Methodist Episcopal church, having founded the Drew ladies' seminary at Carmel, N.Y., and the Drew theological seminary at Madison, N.Y.

* * *

A new and important phase in the Colorado railway situation is the announced decision of the Atchison, Topeka & Santa Fe company to build an independent road from the terminus of its Colorado line at Pueblo north to Denver, a distance of 120 miles. This line will run parallel to the Denver & Rio Grande, through a region furnishing almost no local traffic, and unable, of itself, to support one road—much less two roads in competition. The Atchison company's road being of standard gauge will have the advantage on business between Denver and the east, while the Denver & Rio Grande having a considerable system of its own gauge from Pueblo westward, which is prospectively to reach Leadville and the other mining regions, and also from Pueblo southward toward the San Juan region, will naturally command that business—provided of course, that the Atchison company does not also build alongside of the Rio Grande road to Leadville. By building to Denver the Atchison road gains connection with the Denver & South Park road for Leadville, and with the Colorado Central system for the northern mining regions and the Union Pacific, and can also compete on favorable terms with the Kansas Pacific, as it could not do so well if it operated over the narrow gauge road from Pueblo to Denver. Whether the parallel lines pay the companies or not they will be pretty sure to benefit the public by reducing the present rates, which, on passengers, amount to about ten cents per mile.

* * *

Mr. Jay Gould while in Chicago this week gave a positive denial to the unlikely rumors, which have gained wide newspaper circulation of late, that he has sold or was going to sell his interest in the Union Pacific and was going to extend the Kansas Pacific from Denver to Ogden. He also denied that his visit to Europe had anything to do with the Erie, and said that he had no interest in that road at present.

* * *

The locomotive firemen, at their recent annual convention bravely put themselves on record and proved their order not to be a hostile organization, to be viewed with distrust by their officers, by unanimously passing the following resolution:

Resolved, That this order, the Brotherhood of Locomotive Firemen, totally ignore strikes, and we will hereafter settle our grievances with our employers by arbitration.

In accordance with this a committee on grievances, consisting of twelve members from different parts of the country, was chosen, who will select arbitrators on the part of the firemen in all cases of differences as to wages between the organization and the companies. The firemen will find their officers ready to meet them fairly on this basis of negotiation.

* * *

Seven years ago box cars sold as high as $1,200. Now they can be bought as low as $400. But freight rates have been reduced in even greater proportion. The railways would rather pay the high prices of material, equipment and labor that prevailed then if they could have the business and the rates which they then enjoyed.

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Take the guesswork out of loading trucks and railroad cars with digital computer technology. Eliminate overloads or shortages. Find out about the **only** proven method of weighing material with a front-end loader. Simple to operate. Fits any front-end loader. For complete information call or write:

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Also manufacturers of Belt Scales

Circle 15 on Reader Service Card

SR. TRANSPORTATION COST ANALYST

ICI Americas Inc., a rapidly expanding chemical company, is seeking an ambitious individual with a strong background in transportation cost analysis to join our distribution services department.

Responsibilities include ascertainment, application and negotiation of freight rates via rail, motor, and water modes. Must have significant experience in rail and water pricing/costing/rating and be able to work independently. Requires liaison with marketing personnel in developing distribution cost support/evaluation.

Candidate should have a related degree and in-depth transportation cost analysis experience.

Excellent compensation and benefits package. Qualified candidate should submit resume with salary history and requirements to:

W.P. Mitchell

ICI Americas Inc.
Wilmington, Delaware 19897
an equal opportunity employer m/f

TECHNICAL MANAGER RAILROAD EQUIPMENT

Casi, a subsidiary of Continental Airlines, who supply technical support services to institutions owning or leasing transportation equipment are expanding into the rail equipment field. They seek an invididual with the required technical skills and an interest in sales.

Position: Provide technical and mechanical expertise to support the sale or lease of railroad equipment. Actively involved in programs associated with maintenance modification, repair and refurbishment of railroad motive power and cars.

Qualifications: Eight to ten years in the field of maintenance and maintenance management of motive power or rolling stock, including experience in budgeting and administration, or a B.Sc. Engineering with at least 5 years experience in the management of a locomotive or car shop.

Location: Southern California.

Resume: Please forward a Resume including salary, history and expectations in confidence to:

Canadian Pacific Consulting Services
Room 161
Windsor Station
Montreal, Quebec H3C 3E4
Attn: Mr. G.M. Wansbrough

RAILROAD LOCOMOTIVE MECHANIC

MOVE WEST WITH THE RAILROAD!

The City of Colorado Springs wants and individual with 5 years of experience in the maintenance and repair of diesel electric locomotives. Qualified candidates should also have completed high school and an accredited vocational education program pertaining to the maintenance of the above equipment, or an equivalent combination of education and experience. Salary $1304-$1511/month. Applicants should send resumes to the City of Colorado Springs, Department of Personnel, Attn: Bobbie Sweat, Post Office Box 1575, Colorado Springs, CO 80901.

RAIL FOR SALE

New Industrial Quality
100 lb. ARA-A, 100 lb. RE, 115 lb. RE,
122 lb. 132 lb. RE, 136 lb. RE,

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Grand Valley Steel, 80 Brant St.
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FOR SALE:

2 — #10 — 100 #PS TURNOUTS COMPLETE ..... $2800.00 ea.
10,000 — 5½" base 7½" x 14" D.S.T. PLATES ..... $2.50 ea.
8,000 — 7" x 9" x 8'6" RELAYER TIES — EXCELLENT QUALITY ..... $10.00 ea.
ALL MATERIAL F.O.B. LAMBERTVILLE, NJ. . . TRUCK OR RAIL LOADING. AVAILABLE IMMEDIATELY. . .
CALL 201-768-2711 FOR DETAILS

RAIL CAR REPAIR ROCK MOUNTAIN LOCATION

We are an expanding rail car service company currently in need of an experienced PLANT MANAGER for one of our full service repair shops, located in the Western States.

The Position would report to the Vice President and General Manager and have total responsibility for shop operations plus heavy involvement in renovation and expansion projects currently being undertaken.

We offer an excellent compensation package of base salary plus bonus and full benefits including a profit sharing plan.

Send resume or letter to
Box #485, Railway Age
350 Broadway, New York, NY 10013

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LOCOMOTIVES & LOCOMOTIVE CRANES
ALL SIZES AND MAKES

Call Collect 203-334-0300

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- Flats, 85' and 89'
- 25 Ton GE Locomotives
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- Open Top Hoppers
- Covered Hoppers
- Cabooses (roller bearing trucks)

ALL IN EXCELLENT CONDITION
For details, call: **(602) 264-6937**
RAILROAD RESOURCES
2211 E. Highland, Phoenix, AZ 85016

BOX CARS

50 Ton — Rebuilt 1966 — 50 Ft.
As is or reconditioned for exchange
For Sale or Lease
Naporano Iron & Metal Co. **201-344-4570**
"Pride in Performance"

Experienced Locomotive Rebuild Supervisor

Small shop located in South. Locomotive reconditioning and field maintenance. Expanding company. Send resume and salary history to

Relco Equipment, Inc.
827 Gardner, Joliet, IL 60433

Market

CARLOADINGS

Loadings of revenue freight in the week ended Sept. 1 totaled 488,887 cars, according to the Association of American Railroads. This was a decrease of 4,920 cars, or 1.0%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Sept. 1 are estimated at 17.9 billion, an increase of 1.2% above the corresponding week of 1978.

REVENUE FREIGHT CARLOADINGS

Commodity	Sept. 1 week	Aug. 25 week
Grain	29,220	29,535
Farm products	3,045	3,089
Metallic ores	40,391	42,059
Coal	113,913	112,794
Crushed stone, gravel & sand	18,398	19,142
Nonmetallic minerals	16,869	16,945
Grain mill products	17,946	17,655
Food and kindred products	19,267	19,290
Primary forest products	21,113	21,668
Lumber & wood products (except furniture)	13,107	12,917
Pulp, paper & allied products	22,123	21,557
Chemicals & allied products	28,642	27,929
Petroleum products	6,251	6,518
Stone, clay & glass products	19,526	19,453
Coke	6,184	6,000
Metals & products	19,251	18,800
Motor vehicles & equipment	18,410	15,510
Waste & scrap materials	13,989	14,005
Forwarder & shipper assn. traffic	13,331	12,982
All other carloads	47,482	46,341
LCL traffic	429	418
Total cars loaded	**488,887**	**484,607**

Cumulative total,	1979	1978
35 weeks	16,039,205	15,430,429
Estimated revenue ton-miles (billions)		
35 weeks	598.6	567.1

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Aug. 25 totaled 36,722 cars (down 0.8% below the corresponding 1978 week) and 64,694 trailers or containers (up 0.7% from 1978). Cumulative volume for the first 34 weeks of 1979 is 1,216,043 cars (up 2.2% from 1978) and 2,147,600 trailers or containers (up 4.5% from 1978).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Aug. 21 totaled 5.3 million tons (down 0.7% from 1978). Cars loaded totaled 77,081 (down slightly from 1978). Cumulative loadings for 1979 were up to 163.2 million tons (up 12.4% from 1978).

● *Amtrak.*—Is acquiring RCA two-way radio communications equipment valued at more than $1.8 million for use by workers employed in the Northeast Corridor Improvement Project. The order, which was placed by DeLeuw, Cather/Parsons & Associates, calls for 600 TAC100 portable and TAC200 mobile units. Included are RCA base stations, which will be located between Boston and Washington.

● *Greater Cleveland Rapid Transit Authority.*—A contract in excess of $1 million has been awarded to the WABCO Westinghouse Air Brake Division for friction brake equipment for 48 light rail cars being built for GRCTA by Breda Costruzioni Ferroviarie of Italy.

● *New York Metropolitan Transportation Authority.*—Awarded a $6.1-million contract to General Railway Signal to provide a computer-assisted traffic control system for primary rail commuter lines operated by Conrail for MTA. The contract calls for GRS to supply its new Genralogic microcomputers, a large central computer system, and its Datatrain II coder system for controlling switches and signals along nearly 350 miles of track. The operation will be controlled from six control center dispatchers' consoles with cathode ray tubes and keyboards, teleprinters, and remote terminal units.

● *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

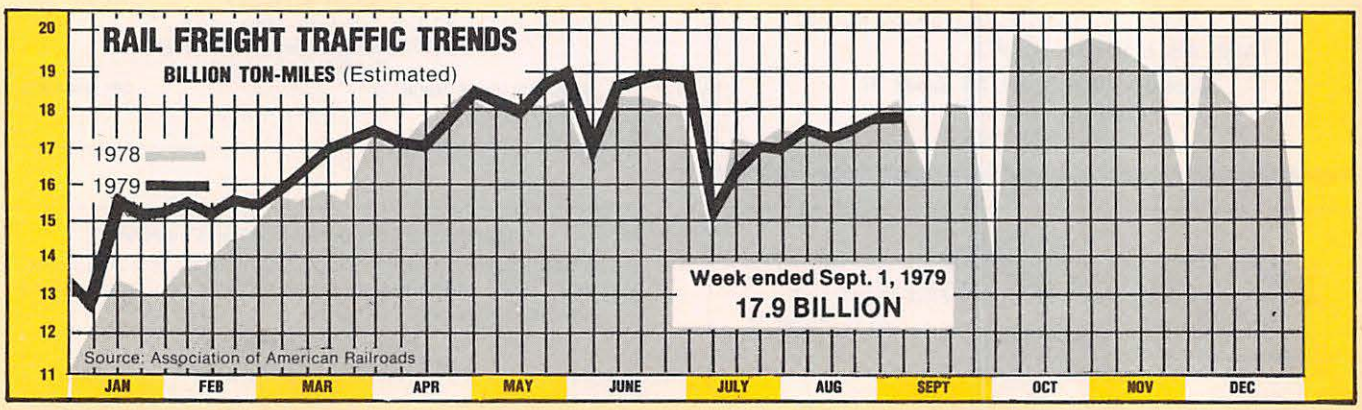
	July		June	Seven Months	
	1979	1978	1979	1979	1978
Built new by carbuilders	5,608	4,351	7,547	47,393	31,953
Built new in RR shops	266	402	492	2,914	2,669
Built new—total	5,874	4,753	8,039	50,307	34,622
Rebuilt	90	38	106	518	1,287
TOTAL DELIVERED	**5,964**	**4,791**	**8,145**	**50,825**	**35,909**
Locomotives (new and rebuilt)	100	105	159	953	749

ORDERED

To be built new by carbuilders	6,293	11,265	6,639	77,698	72,621
To be built new in RR shops	700	334	0	1,613	784
To be built new—total	6,993	11,599	6,639	79,311	73,405
To be rebuilt	84	0	92	454	122
TOTAL ORDERED	**7,077**	**11,599**	**6,731**	**79,765**	**73,527**

ON ORDER AND UNDELIVERED

	August 1		July 1	Average Backlog	
	1979	1978	1979	1979	1978
To be built new by carbuilders	119,793	70,426	119,335	111,622	48,565
To be built new in RR shops	5,010	4,535	4,576	5,459	5,462
To be built new—total	124,803	74,961	123,911	117,081	54,027
To be rebuilt	23	111	29	102	675
TOTAL ON ORDER	**124,826**	**75,072**	**123,940**	**117,183**	**54,702**
Locomotives (new and rebuilt)	912	891	1,012	1,117	680



Introducing New

Zippy Coast-to-Coast all Piggyback Run-Thru Service

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Handling freight YOUR WAY
is our way of serving you
Santa Fe

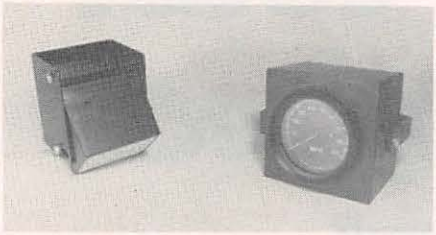
Santa Fe and Conrail have joined together to provide intermodal shippers with the first transcontinental piggyback run-thru service. Fifth morning West Coast availability!

Now trailers originating from points in the New England, New York City and North Jersey areas will move non-stop via Streator, Illinois, directly to Argentine, Santa Fe's modern automated classification yard at Kansas City, bypassing the busy Midwest terminals where winter weather can create havoc.

Comparable service will be provided eastbound.

For more information and details on transcontinental piggyback run-thru service, contact the nearest Santa Fe Sales Center listed in the Yellow Pages.

Products Report



Locomotive speedometer

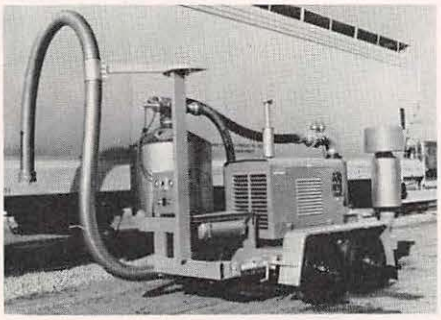
Using the Doppler radar principle, a new locomotive speedometer offered by CMI, Inc., operates independently of all locomotive moving parts and is said to be the most accurate speed-measuring device available today. Radometer is easily retrofitted to any locomotive in an average of less than three hours, and can operate from voltages of 12 V dc and 32 V dc through 74 V dc. The transceiver is mounted to the draft gear strap, the indicator in the cab. Once installed, it requires no recalibration for wheel wear and indicates accurate speed during wheel slip, whether braking or accelerating. Proven in 18 months of field testing before production, the unit is designed for a life of 15 years. Units come standard with 6-inch meters, 0-90-mph indicator, 22-Hz/mph recorder output, and overspeed relay controls set in mile-per-hour increments. Options available include 0-50-mph indicator, 0-150-kph indicator, 0-80-kph indicator, 2.75-Hz/mph recorder output, 8-inch meter, and digital display readout.

Circle 60 on Reader Service Card

Wheel presence detector

A new wheel presence detector offered by General Railway Signal Co. for car classification yards and high-speed main lines detects wheels within a limited range of about six inches at speeds down to zero miles per hour. Two units make up the system: an encapsulated magnetic detection unit attached to the rail, and a supporting electronic unit, housed in a nearby foundation-mounted junction box. The detector uses high-reliability parts and emits only one signal for each wheel. The electronic circuit board unit can be ordered in two varieties: One provides an output simulating a relay contact closure, the other provides a voltage pulse output. An indication is provided if the magnetic unit becomes detached from the rail. A 12-V battery powers the system, and the electronic unit can drive the detection pulse through one mile of cable.

Circle 61 on Reader Service Card



Dry bulk materials conveyor

A new dry bulk materials air conveyor offered by United States Systems, Inc., transfers pellets, resin, and similar materials from rail car to truck, storage, or use at rates of 60,000 pounds per hour. The diesel-powered U.S.S. Cycle Matic 25 Air Conveyor handles all dry bulk materials, has fully automatic controls (count and shutdown prevents overloading), and requires just one operator. It has a 25-cubic-foot stainless steel P-D Pot with all inside welds ground and polished. The low-silhouette, unitized trailer frame permits both high-speed highway travel and railyard mobility.

Circle 62 on Reader Service Card

Hydraulic rail shear

A new hydraulic rail shear offered by Chemetron's Railway Products division is made for true-to-profile removal of excess steel of Thermit in-track welds, with only the rail head and upper part of the foot risers trimmed. The weld can be sheared five minutes after pouring without subjecting the hot welding zone to tensile stresses from the shearing operation, thus eliminating damage to the weld, such as hot tears, by the pinching action design.

Circle 63 on Reader Service Card

Diesel oil additive

Formulated to remove and prevent acids, water, gums, tars, and the like from accumulating in diesel engines, a new blend of detergents, rust inhibitors, combustion aids, and sludge dispersants is offered by Research Products Co./Aero Mist, Inc. RP-#1 Diesel Oil Additive is said to keep tanks, pumps, strainers, lines, and valves free from deposits of soot and sludge; to improve combustion; to reduced smoke; and to cut downtime and repair costs.

Circle 64 on Reader Service Card

Biodegradable ice melter

A fully biodegradable ice and snow melter that is salt free, chloride free, and nontoxic is offered by Petrokem Corp. for use where corrosive chemicals could damage equipment and the surrounding environment. Enviromelt is available in 25- and 100-pound bags and 100-pound fiber drums. It can be safely used on concrete and asphalt roadways, taxi ramps, etc., and will not harm animals or people, autos, carpets, clothing, or similar items.

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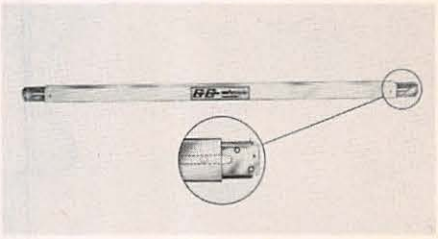

Improved cargo-shoring beam

An improved cargo-shoring beam for use with Aeroquip Series A or E track and most punched posts with face-to face dimensions of 86¼ to 94½ inches is offered by Aeroquip Corp.'s Industrial Division. The FE8000-1 beam (which replaces the FE7950-2 beam) has an improved end fitting formed of heavy-gauge steel and reinforced to resist keeper binding, buckling and wear. The end fitting is cadmium-plated for corrosion resistance, and a new keeper spring design reduces the chance of spring loss.

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Easy-off grafitti

A new all-surface, clear, protective coating offered by Laclede Research Laboratories permits easy and economical re-

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moval of grafitti from the surfaces of transportation vehicles, building walls, etc. Global Guard all-surface protectant is a clear, water-based, plastic coating that is easily applied by brush, roller, sponge, squeegee, or spray. When dry, it becomes water insoluble and will not yellow or discolor with time. Smog and other pollutants, including climatic erosion agents, will not affect the coating; grafitti cannot penetrate it. If a particular area is vandalized with grafitti, wiping it with Global Guard Solvent removes the coating and the grafitti along with it. Recoating the area renews the protection. For cleaning without removal, mild soap and a rinse with water suffices.

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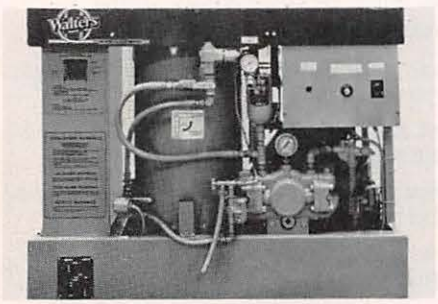

Hot spray cleaning machines

Improved versions of the Series 200 VHP Combination Hot Spray Cleaning Machines, with both high-pressure washing and steam-cleaning capabilities, are offered by Walters Manufacturing Co. Some models now incorporate Powerblast action—extra-large droplets of hot or cold water under pressures up to 850 psi—to facilitate removal of hardened deposits of oily mud and clay-based soils from heavy equipment. Steam-cleaning mode is now available in the 135-gph capacity at 150 psi and, on some models, in the more powerful 190-gph capacity at 225 psi. As a high-pressure washer, units produce 240 gph or (some models) 400 gph at 900 psi. New burner and heating coil/combustion designs are said to effect fuel savings of up to 10%. New options include a gasoline engine drive with electric starter and battery, a tricycle mounting for easy portability, a single-axle highway trailer, and a remote control system with automatic stop.

Circle 68 on Reader Service Card

Industrial wiper test kit

Railroads can compare their industrial wipers with those made by Chicopee by using a free cost-performance comparison kit offered by the company. The kit contains samples of MASSLIN Shop Towels and Industrial Towels and RETICULON Industrial Wipes, plus a four-page brochure describing easy tests to compare cost and performance of wipers. Tests can be performed at a desk, and when observations are entered in the test brochure and returned to Chicopee, the company will send a free test quantity of industrial wipers most appropriate for the users needs in further, on-the-job evaluation.

Circle 69 on Reader Service Card

New Literature

BATTERIES. A brochure covering batteries for diesel-engine starters is offered by KW Battery Co.

Circle 85 on Reader Service Card

STORAGE GEAR. A 48-page catalog of steel pallet racks, storage shelving, modular mezzanine decks, and bulk storage racks is offered by Storex Corp.

Circle 86 on Reader Service Card

NONWOVEN FABRIC used to reinforce and stabilize poor load-bearing soils, as for railroad track beds, Supac is described in detail in a technical bulletin offered by Phillips Fibers Corp.

Circle 87 on Reader Service Card

THERMOPLASTIC SHEETING for lightweight, decorative, and durable transit car interiors and components, Boltaron 6800 is described in a brochure offered by GTR Plastic Film Co.

Circle 88 on Reader Service Card

Announcing a New Official Guide Reprint: The Year of America's Greatest Railway Mileage

JUNE 1916 OFFICIAL GUIDE OF THE RAILWAYS

THE ORIGINAL ISSUE was 1,640 pages long, incorporating railroad and steamship listings. This GUIDE reflects the prosperity of the railroads at the time and their pre-war extravagance. Many railroads carried their own station indices. Graphic decorations adorn many listings, which were oriented toward selling rail travel. (Just a few years later the government, then controlling the railroads, required them to remove these indices, eliminate "puffing advertising," and drop unnecessary ornamentation to save paper.) Railroads were slow to replace it after the war, thus the 1916 issue represents a pre-World War I highpoint in timetable-making and the advertising man's art. June was also the month that the railroad plant, measured by its mileage, reached a peak that it would never again attain. The contents of the GUIDE, described in a contemporary advertisement, included:

> "The latest official time-tables of all Railways and Steam Navigation Lines on the entire North American Continent. Names of Officials of all railways of the United States, Canada, Mexico, Porto Rico, Cuba and Central America. List of Railway Stations showing the Road on which each is located. There are about 90,000 such Stations, and additions are constantly being made. List of Landings by Steam Navigation Lines, showing the Lines touching at each point. Maps of Railway Systems and a [32-page] General Railway Map of the United States, Canada, Mexico, Porto Rico, Cuba and Central America. Standard Time Map showing dividing points. Notes on improvements and extensions of Old and Opening of New Roads. Changes in the Personnel of Railroad Officials Throughout the Country. The routing of practically all inter-line passenger and freight traffic by rail or water, is based on the information contained in THE OFFICIAL GUIDE, all of which is revised and corrected each month."

THE REPRINT will be in 6-7/8" x 10" format, softbound. The book will be printed on a good quality stock, so even collectors who have original copies printed on the fragile paper of the period will want reprints to use regularly.

THE PRINTING WILL BE LIMITED and the reprint will be available only by mail from us. Orders will be fulfilled around October 1, 1979.

TO RESERVE A COPY send a check or money order for $27.50 to OFFICIAL GUIDE REPRINTS, 424 West 33rd Street, New York, NY 10001 (New York State residents add sales tax). After October 1, 1979, the price will be $30.00 per copy.

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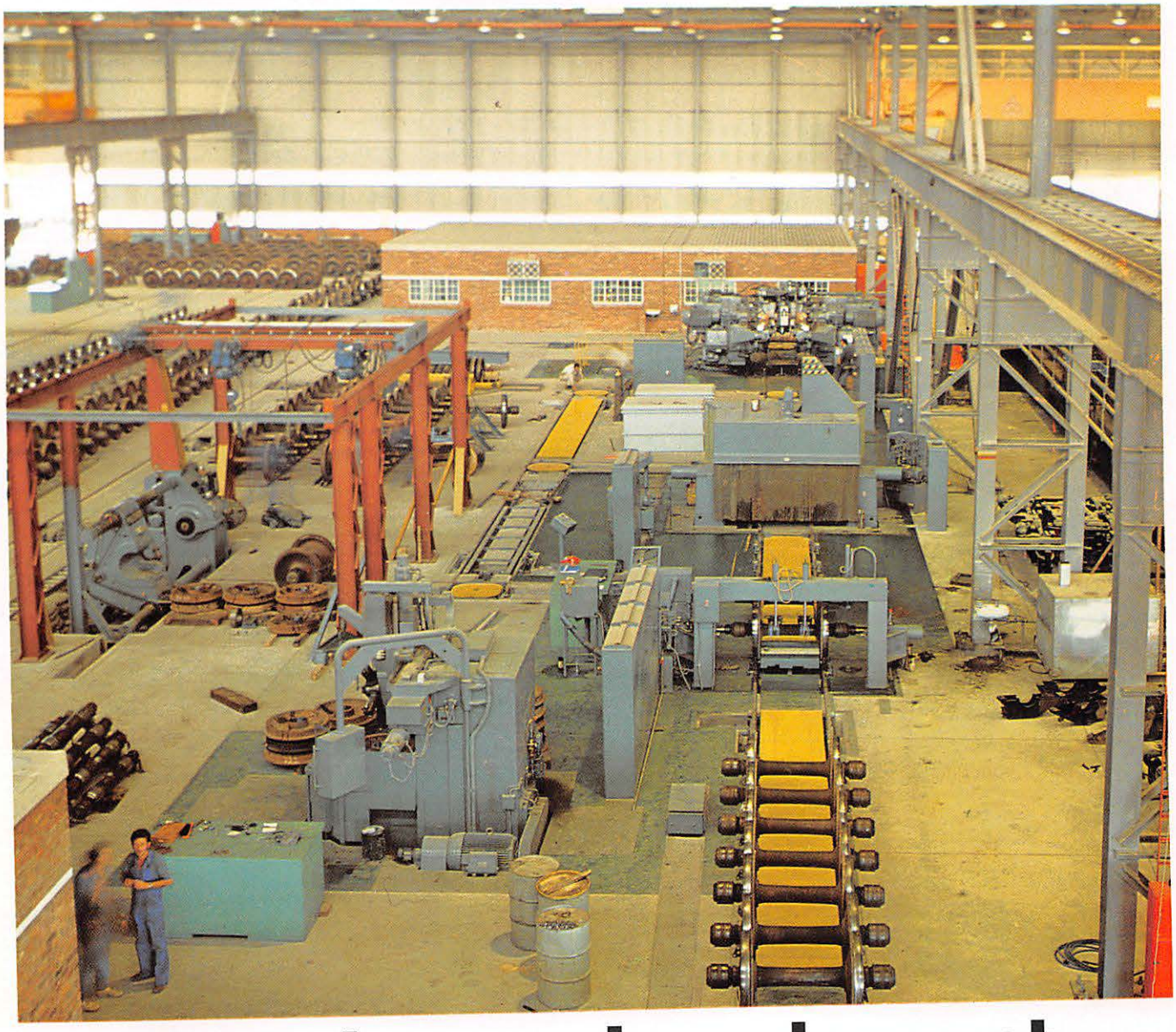

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- The interior of the caboose was given an acoustical treatment consisting of 1" thick flexible polyurethane foam with a perforated vinyl surface.

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